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Results for the Spanish Survey in the NAFO Regulatory Area of Division 3L for the period 2003-2012

by

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Abstract

Since 2003, a stratified random summer bottom trawl survey was conducted by Spain in the NAFO Regulatory Area of Division 3L (Flemish Pass). The surveys were carried out by the R/V *"Vizconde de Eza"* using bottom trawl net type *Campelen*. Entire series of mean catches, biomass and length distribution for Greenland halibut, American plaice and witch flounder are presented for the period 2003-2012. Greenland halibut biomass and abundance estimates show an increasing trend since 2003, cut in year 2009. In 2011-2012 the biomass drops under the 2006 value. American plaice biomass and abundance estimates present an increasing trend since 2010. Regarding witch flounder, the biomass and abundance decreased in 2012, but there is no a clear trend in the period 2003-2012.

KEYWORDS: Survey, Flemish Pass, Greenland halibut, American plaice, witch flounder.

Material and Methods

The Spanish surveys in Div. 3L of NAFO Regulatory Area (Flemish Pass) were initiated in 2003. The Research vessel *"Vizconde de Eza"* has carried out these surveys following the same procedures and using the same bottom trawl gear *Campelen 1800*. In 2003, the survey was carried out in spring (June) and it did not cover all strata adequately (69% of the total area prospected in 2006-2012). In 2004, the survey was carried out in August, for a period of nine days, and it covered only the 96%. In 2005, it was not possible to perform the survey due to problems with the winch of the ship; and in 2006, for the first time, an adequate prospecting survey was conducted in Division 3L with over 100 valid hauls. Table 1 presents the number of valid tows, the depth strata covered and the dates of the survey series. Figure 1 shows haul positions of Spanish surveys in NAFO Div. 3L in the period 2003-2012.

The survey area was stratified following the standard stratification schemes (Bishop, 1994). All surveys had a stratified random design following NAFO specifications (Doubleday, 1981). Hauls were allocated to strata proportionally to stratum size, with a minimum of two planned hauls per stratum and the trawl positions were chosen at random. A synoptic sheet of the survey with the vessel and gear characteristics is shown in Table 2. Biomass and abundance indices were calculated by the swept area method (Cochran, 1997), assuming catchability factor of 1.

The catch from each haul was sorted out and weighted by species and a randomly selected sample of each species was taken in order to measure it and to obtain the length distribution. For Greenland halibut, American plaice and witch flounder, each individual of the sample was measured to the total length to the nearest lower cm. and data are given in 2 cm intervals. We present on a yearly basis: the mean catch per haul, the stratified mean catch per haul, the biomass with its variance per year and the length distribution in number per haul stratified mean catches by length, sex and year for each species in the period 2003-2012.

Biological studies (age, growth, feeding,..), oceanographic data and special studies (occurrence of marine mammals and sea birds) were collected from NAFO Regulatory area Div. 3L during the survey aboard *Vizconde de Eza*. The following formula was used to obtain the biomass from length distribution: Weight=a (Length+0.5)^b .

Stratified mean catches and SD

The mean catch ($\bar{y}_i$) and the variance (Var_i) are calculated by stratum by the following formulas:

$$\bar{y}_i = \sum_{j=1}^{T_i} \frac{y_j}{T_i}, \quad i = 1,...,h$$

$$Var_i = \sum_{j=1}^{T_i} \frac{(y_j - \bar{y}_i)^2}{T_i - 1}, \quad i = 1,...,h$$

where:

y_j is the catch in haul j

T_i is the number of hauls in the stratum i

h is the total number of strata

and the stratified mean catch ($\bar{y}_i^{str}$) and the stratified variance (Var_i^{str}) by stratum are obtained as follow:

$$\bar{y}_i^{str} = \bar{y}_i n_i, \quad i = 1,...,h$$

$$Var_i^{str} = Var_i \frac{n_i^2}{T_i}, \quad i = 1,...,h$$

where:

n_i is the area of the stratum i , $i = 1,...,h$

Then the total stratified mean catch ($\bar{Y}$) and the variance (Var) by year are calculated according to the formulas:

$$\bar{Y} = \sum_{i=1}^{h} \frac{\bar{y}_i^{str}}{N}$$

$$Var = \sum_{i=1}^{h} \frac{Var_i^{str}}{N^2}$$

where:

$N = \sum_{i=1}^{h} n_i$ is the total area by year

The stratified standard deviation (SD) by year is calculated as the square root of the stratified variance by year.

Results

In 2012, the bottom trawl survey in Div. 3L (Flemish pass) of NAFO Regulatory Area was carried out on board R/V *Vizconde de Eza* using the usual survey gear (*Campelen 1800*) from July 30th to August 18th and following the same procedure as in previous years. A total of 105 hauls (7 of them null) were performed in a depth range of 112-1478 m. (Table 1).

Biological studies

Biological data (length, sex, sexual maturity, weight and stomach repletion degree) on 9 target species and other 34 species were collected from Div. 3L in 2012 (19336 individuals sampled).

Maturity and fecundity – 390 samples for histological maturity and fecundity of Greenland halibut, cod, American plaice and *Anarhichas lupus* were taken.

Age and Growth – otoliths (1061 samples) of Greenland halibut, American plaice, roughhead grenadier and cod were collected for growth studies.

Feeding studies were performed on some demersal species (*Reinhardtius hippoglossoides, Hippoglossoides platessoides, Gadus morhua, Notacanthus chemnitzii, Hydrolagus affinis* and *Harriotta Raleighana*) and 1532 stomach contents were analysed from depths of 112 to 1329 m.

Hydrographic Studies

Temperature and salinity were measured in each haul by means of CTD ((SBE Se 25 SEALOGGER CTD). Hydrographic profile samplings were performed at 98 fishing stations in a depth range of 105-1369 m. The minimum and maximum observed temperatures were –1.18 and 3.93 ºC respectively and the observed salinity range was 33.06 - 34.93 PSU. Results are presented in MEDS (Marine Environmental Data Service of Canada) every year.

Special studies

Benthic invertebrate

The study of benthic invertebrates was performed as a routine work during the survey (catch in weight and number, photographs and collection for study in the laboratory). This study will help us to have more knowledge about these species and their relation to the marine environment in the surveyed area. A total of 179 working categories were identified to the lowest possible taxonomic level.

Marine mammals and sea birds

Observations and incidental catches of marine mammals occasionally occurred were recorded during fishing time in the surveyed area of Flemish Pass. Occurrence, date, position, number, Tª, fishing time and other data were collected related to marine mammals throughout the survey. In 19 hauls, observations of 3 marine mammals species (*Physeter macrocephalus, Globicephala melas* and *Hyperoodon Ampullatus*) were recorded.

Regarding seabirds, information about species, and incidental catches was also collected in the surveyed area. This will help us get a better understanding of these species, their relation to the marine environment and the interaction of seabirds with fishing. *Fulmarus glacialis, Puffinus gravis, Puffinus grisseus, Morus bassanus and Catharacta skua* were the most common seabird species.

Results for Greenland halibut, American plaice and witch flounder are presented in this report. The results for the rest of target species will be presented in other SCR in this SC meeting. The detailed results for Northern shrimp, the most abundant species in the catches of all surveys, were presented in Casas *et al*., 2012.

Greenland halibut (*Reinhardtius hippoglossoides* Walbaum, 1792)

The Greenland halibut stock in Subarea 2 and Div. 3KLMNO is considered to be part of a biological stock complex, which includes Subareas 0 and 1. Abundance and biomass indices were available from research vessel surveys by Canada in Div. 2J+3KLMNO (1978-2012), EU in Div. 3M (1988-2012) and EU-Spain in Div. 3NO (1995-2012). Greenland halibut is managed under a fifteen year rebuilding programme that started in 2004. The catches in 2004-2010 have exceeded the rebuilding plan TACs by 30% on average, despite the reduction in fishing effort.

Catches increased sharply in 1990 due to a developing fishery in the NAFO Regulatory Area in Div. 3LMNO and continued at high levels during 1991-94. The fishable biomass declined to low levels in 1995-97 due to very high catches and high fishing mortality. It increased during 1998-2000 due to greatly reduced catches, much lower fishing mortality and improved recruitment. Biomass increased over 2004-2008 with decreased in fishing mortality. The current estimates (2004-2011) of fishable biomass are amongst the lowest in the series. Recent recruitment has been below average, and fishing mortality remains high (NAFO, 2012).

Mean catches and biomass

Table 3 shows the swept area, the tow number, the mean catches and their variance per haul and year for Greenland halibut. Table 4 and Figure 2 present the stratified mean catches per stratum with the total variance per year. Table 5 and Figure 3 present the abundance, the biomass per swept area per stratum and their total variance per year. Table 6 presents the length-weight relationships.

The biomass of the Greenland halibut has had an increase in the surveyed area along the whole period, mainly in 2008. However, in 2011-2012 the biomass has decreased, reaching the same level as in 2006. The biomass presents the same trend as mean catches since the year 2004. In 2003, the mean catch does not follow the same pattern; this was probably due to the less area covered in 2003 survey (Figures 2 and 3).

Figure 4 shows a map with the distribution of Greenland halibut catches per haul in 2012 Spanish 3L survey.

Length distribution

Table 7 and 8 present the stratified mean catches per haul length distribution for the Greenland halibut, by sex and year, with the number of samples in which there were length measures, the total number of individuals measured in these samples, the sampled catch and the range of lengths met, as well as the total catch of this species and the total valid hauls made in the survey. In Figures 5 and 6 the evolution along the years can be followed.

In 2011 and 2012 a decreased in number of individuals for lengths between 30-81 cm. can be seen. A good recruitment can be observed in the whole period, mainly in 2006; although the number of individuals of length over 70 cm. is very low. Biomass and stratified mean catch increased in 2007, but the number of individuals per stratified mean catches decreased, due to the good recruitment in 2006. The same process happened in 2009 and 2010. The highest recruitment was in 2006, as observed in Fig. 5, with 14 cm length classes mode.

American plaice (*Hippoglossoides platesoides* Fabricius, 1780)

There was no fishing targeting American plaice in 1994 and it has been under moratorium since 1995. Catches increased after the moratorium until 2003 and began to decline afterwards. Biomass and SSB remain low compared to historic levels. SSB declined to the lowest estimated level in 1994 and 1995. It has increased since then but it still remains very low. There has been no good recruitment to the exploitable biomass since the mid-1980s (NAFO, 2012).

Mean catches and biomass

American plaice haul mean catches by stratum are presented in Table 9, including swept area, number of hauls and SD. Stratified mean catches per tow by stratum and year and their variance are presented in Table 10.

The entire time series (2003-2012) of biomass and their SD estimates of American plaice are shown in Table 11. Length-weight relationships are presented in Table 6.

The American plaice indices showed a general increasing trend in the prospected area since 2004 (Fig. 7 and 8). But in 2010 this increasing trend was broken and the value was below the 2006 value, following by an increase in 2011 and 2012. The highest values in the estimated biomass have been observed in the shallowest strata, in a range of depth from 93 to 274 meters. Figure 4 shows a map with the distribution of the American plaice catches per haul in 2012 Spanish 3L survey.

Length distribution

Tables 12 and 13 present the stratified mean catches per haul length distribution by sex and year. They present also the number of samples in which length measurements were performed, the total number of individuals measured in these samples, the sampled catch and the range of lengths found. The total catch of this species and the total valid hauls made in the survey are shown too. In Figures 6 and 9 the evolution along the years can be followed.

For this species, there is a quite good presence of small individuals (around 10-16 cm) since 2006. There is higher proportion of females than males.

Witch flounder (*Glyptocephalus cynoglossus* Linnaeus, 1758)

The fishery for witch flounder in NAFO Divisions 2J, 3K and 3L began in the early 1960s and increased steadily from about 1 000 t in 1963 to a peak of over 24 000 t in 1973. Witch flounder stock has remained at a low level since 1995. However, a slight increasing trend in the total stock survey biomass index has been observed since 2003 but it remains at a very low level. In the past this stock had been fished mainly in winter and springtime on spawning concentrations but is currently only a bycatch of other fisheries. Based on survey indices for the current year (NAFO, 2012), there is nothing to indicate a change in the status of the stock. No directed fishing on witch flounder is recommended in Div. 3L.

Mean catches and biomass

Table 14 shows the swept area, the tow number, the mean catches and their variance per haul and year for witch flounder. Table 15 and Figure 10 present the stratified mean catches per stratum with the total variance per year. Table 16 and Figure 11 present the abundance and biomass per swept area per stratum and their total variance per year. Parameters *a* and *b* estimated values of length-weight distribution are presented in Table 6. Figure 4 shows a map with the distribution of the witch flounder catches per haul in 2012 Spanish 3L survey.

Witch flounder indices show no clear trend throughout the period 2003-2012, the index peaked in 2010. However, biomass declined again in 2012. Estimated biomass ranged from 691 t in 2010 to 297 t and 298 t in 2003 and 2007 respectively; although most estimate results come from few strata. The stratified mean catches per stratum followed similar trends as the biomass and abundance indices (Fig. 10 and 11).

Length distribution

Table 17 and 18 present the stratified mean catches per haul length distribution for this species, by sex and year, with the number of samples in which there were length measures, the total number of individuals measured in these samples, the sampled catch and the range of lengths met, as well as the total catch of this species and the total valid hauls made in the survey. In Figures 6 and 12 we can follow the evolution along the years.
The highest recruitment was in 2003, but since then the number of younger individuals have declined.

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TABLE 1.- Spanish bottom trawl surveys in NAFO Division 3L for the period 2003-2012.

Year	Vessel	Valid tows	Depth strata covered (m)	Surveyed strata (no.)	Dates
2003	R/V *"Vizconde de Eza"*	39	118-1100	17	June 2 - June 6, June 29
2004	R/V *"Vizconde de Eza"*	50	141-1452	23	August 7 - August 15
2005	-	-	-	-	-
2006	R/V *"Vizconde de Eza"*	100	116-1449	24	July 31 - August 18
2007	R/V *"Vizconde de Eza"*	94	119-1449	24	July 23 - August 11
2008	R/V *"Vizconde de Eza"*	100	105-1455	24	July 24 - August 11
2009	R/V "*Vizconde de Eza"*	98	111-1458	24	July 25 - August 12
2010	R/V "*Vizconde de Eza*"	97	119-1462	24	July 25 - August 14
2011	R/V "*Vizconde de Eza"*	89	115-1419	24	August 10 - August 24
2012	R/V "*Vizconde de Eza"*	98	112-1478	24	July 30 - August 18

TABLE 2.- Technical data of the Spanish survey in NAFO Division 3L for the period 2003-2012.

Procedure	**Specification**
Vessel	R/V *"Vizconde de Eza"*
GT	1400 t.
Power	1800 HP
Surveyed area	Div. 3L (depth < 1500 m, outside ZEE Canada)
Mean trawl speed	3 knots
Trawling time	30 minutes effective time
Fishing gear type	*Campelen 1800*
Headline	29.5 m
Groundrope	19.5 m
Type of groundrope	34 rockhopper
Floats	(2 x 39) + 10
Bridle	40 m (20 mm)
Vertical opening	4-5
Horizontal opening	26
Trawl doors	Polyvalent, 1400 Kg
Warp	20 mm
Warp to depth ratio	$22.287 * \text{Depth (m)}^{0.6667}$
Mesh size in the cod-end	44 mm
Type of survey:	Stratified random bottom trawl survey
Criterion to change position of a selected tow	Unsuitable bottom for trawling according to commercial fish information or ecosonder register. Information on gear damage from previous surveys.
Criterion to reject data from tow	- Severe tears in the gear - tears in cod-end - Less of 20 minutes tow - Bad behaviour of the gear
Daily period for fishing	6.00 to 22.00 hours
Target species	Greenland halibut, American plaice, Atlantic cod, roughhead grenadier, witch flounder, thorny skate, red fish, black dogfish, northern shrimp.

TABLE 3.- Swept area, number of hauls and **Greenland halibut** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2012, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2012. n.s. means stratum not surveyed.

Stratum	2003 (*)				2004				2006				2007				2008			
	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD
385	0.0225	2	0.000	0.000	0.0229	2	6.025	7.814	0.0229	2	15.721	8.173	0.0225	2	16.750	6.293	0.0229	2	18.011	17.521
387	0.0229	2	15.890	6.661	0.0214	2	65.550	13.930	0.0225	2	52.500	4.950	0.0225	2	31.050	6.576	0.0435	4	46.511	13.072
388	0.0334	3	20.870	13.452	0.0105	1	42.700	-	0.0566	5	47.424	8.026	0.0563	5	50.036	21.899	0.0559	5	31.870	17.546
389	0.0454	4	0.459	0.507	0.0225	2	5.770	1.796	0.0795	7	32.941	14.261	0.0900	8	37.473	14.697	0.0780	7	42.616	22.552
390	0.0563	5	0.020	0.029	0.0345	3	0.000	0.000	0.1249	11	12.967	16.007	0.1350	12	6.454	10.772	0.1395	12	5.138	7.236
391	0.0338	3	0.313	0.369	0.0218	2	5.710	4.398	0.0450	4	17.633	5.302	0.0450	4	15.750	5.063	0.0454	4	22.882	4.673
392	0.0116	1	12.500	-	0.0214	2	15.600	10.607	0.0229	2	6.900	3.111	0.0225	2	42.350	34.153	0.0221	2	11.370	3.210
729	0.0210	2	34.860	7.552	0.0221	2	30.500	3.394	0.0338	3	24.120	9.552	0.0338	3	24.695	4.326	0.0338	3	17.887	7.697
730	0.0221	2	24.400	5.798	0.0221	2	7.650	2.616	0.0326	3	8.403	6.415	0.0225	2	4.840	3.620	0.0323	3	40.777	14.460
731	0.0229	2	36.350	2.758	0.0233	2	27.260	3.338	0.0341	3	16.643	6.408	0.0338	3	31.299	16.813	0.0330	3	42.527	10.506
732	0.0113	1	43.100	-	0.0210	2	11.050	0.778	0.0334	3	6.570	3.380	0.0338	3	9.847	3.027	0.0446	4	42.878	42.441
733	n.s.	n.s.	n.s.	n.s.	0.0330	3	18.233	2.495	0.0454	4	18.556	8.530	0.0338	3	24.610	12.655	0.0431	4	31.780	5.015
734	n.s.	n.s.	n.s.	n.s.	0.0304	3	20.567	11.620	0.0225	2	4.478	1.340	0.0225	2	4.639	1.940	0.0221	2	7.603	1.948
741	0.0113	1	27.200	-	0.0323	3	11.517	6.225	0.0218	2	5.648	0.583	0.0225	2	4.590	6.491	0.0210	2	7.005	5.961
742	0.0116	1	31.800	-	0.0120	1	31.100	-	0.0229	2	10.593	1.453	0.0225	2	4.728	1.503	0.0210	2	14.420	16.150
743	n.s.	n.s.	n.s.	n.s.	0.0188	2	8.765	10.090	0.0225	2	4.750	6.718	0.0225	2	10.925	2.185	0.0203	2	6.460	2.531
744	n.s.	n.s.	n.s.	n.s.	0.0101	1	7.500	-	0.0229	2	10.520	9.588	0.0218	2	28.770	21.835	0.0221	2	23.345	16.553
745	0.0341	3	11.000	8.296	0.0319	3	12.933	1.026	0.0686	6	7.227	3.098	0.0675	6	8.536	4.108	0.0555	5	20.900	19.813
746	0.0446	4	29.503	16.252	0.0338	3	9.533	5.315	0.0675	6	5.672	4.188	0.0664	6	6.965	6.921	0.0638	6	56.842	58.887
747	n.s.	n.s.	n.s.	n.s.	0.0308	3	0.507	0.443	0.1230	11	4.328	5.447	0.1238	11	5.519	6.837	0.1069	10	14.341	11.441
748	0.0109	1	13.700	-	0.0199	2	6.375	5.056	0.0326	3	3.428	4.404	0.0338	3	6.460	6.984	0.0218	2	13.600	5.940
749	0.0221	2	8.540	4.016	0.0221	2	6.550	9.263	0.0229	2	4.250	6.010	0.0113	1	4.010	-	0.0214	2	20.670	21.171
750	n.s.	n.s.	n.s.	n.s.	0.0180	2	0.000	0.000	0.1005	9	10.041	12.221	0.0679	6	9.362	16.847	0.0844	8	14.689	17.321
751	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s	n.s	0.0454	4	4.570	5.958	0.0225	2	20.400	15.981	0.0413	4	20.053	13.204

$$(**)\ SD = \frac{\sum (x_i - \bar{x})}{n-1}$$

TABLE 3 (cont).- Swept area, number of hauls and **Greenland halibut** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2012, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2012. n.s. means stratum not surveyed.

Stratum	2009				2010				2011				2012			
	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
385	0.0225	2	4.975	0.318	0.0225	2	1.250	1.768	0.0229	2	13.100	18.526	0.0225	2	0.077	0.033
387	0.0439	4	33.070	21.146	0.0458	4	23.848	6.951	0.0450	4	12.053	6.860	0.0450	4	12.385	6.631
388	0.0555	5	13.421	9.628	0.0570	5	19.602	14.676	0.0563	5	8.313	4.980	0.0570	5	11.348	9.920
389	0.0803	7	19.759	12.838	0.0795	7	10.144	8.949	0.0675	6	11.408	7.061	0.0799	7	31.210	19.695
390	0.1373	12	1.561	3.604	0.1249	11	0.168	0.535	0.1009	9	0.272	0.682	0.1354	12	0.546	0.949
391	0.0458	4	4.841	3.069	0.0454	4	6.375	7.709	0.0458	4	2.492	2.592	0.0458	4	13.929	11.759
392	0.0229	2	13.289	8.925	0.0225	2	10.390	2.673	0.0229	2	14.425	3.910	0.0225	2	15.750	9.405
729	0.0341	3	24.099	8.265	0.0338	3	20.733	6.933	0.0338	3	9.022	8.348	0.0338	3	12.673	0.142
730	0.0338	3	30.067	18.658	0.0334	3	20.463	2.567	0.0334	3	7.777	1.600	0.0338	3	5.110	3.891
731	0.0341	3	22.403	5.724	0.0338	3	39.567	9.874	0.0334	3	4.090	4.112	0.0341	3	12.457	6.138
732	0.0450	4	48.133	5.976	0.0450	4	56.683	13.345	0.0454	4	21.440	9.450	0.0454	4	18.880	0.566
733	0.0450	4	36.692	27.661	0.0450	4	37.143	30.058	0.0454	4	10.543	4.091	0.0454	4	10.857	4.842
734	0.0218	2	58.850	16.051	0.0225	2	32.400	18.102	0.0225	2	11.243	0.457	0.0233	2	15.680	7.212
741	0.0221	2	35.435	26.962	0.0225	2	29.235	15.450	0.0218	2	19.255	22.267	0.0218	2	25.510	1.287
742	0.0214	2	38.950	16.334	0.0225	2	57.540	42.936	0.0225	2	11.545	4.320	0.0206	2	22.640	13.520
743	0.0203	2	24.204	23.895	0.0225	2	49.975	30.399	0.0221	2	23.185	0.813	0.0206	2	8.713	11.791
744	0.0210	2	31.190	28.864	0.0229	2	49.185	42.052	0.0221	2	25.710	28.100	0.0221	2	15.390	1.994
745	0.0559	5	29.738	14.643	0.0563	5	32.666	9.796	0.0446	4	26.923	10.448	0.0570	5	32.570	9.295
746	0.0668	6	23.069	23.422	0.0679	6	41.340	32.988	0.0566	5	14.369	8.047	0.0675	6	11.888	7.577
747	0.1118	10	11.324	7.418	0.1125	10	12.295	15.087	0.0893	8	8.655	3.839	0.1121	10	10.522	7.681
748	0.0229	2	67.150	60.458	0.0225	2	18.650	18.031	0.0221	2	13.755	0.502	0.0225	2	5.680	3.776
749	0.0225	2	20.250	4.313	0.0229	2	10.790	0.919	0.0221	2	15.695	9.199	0.0221	2	7.755	3.118
750	0.0791	7	14.907	9.349	0.0900	8	45.238	32.993	0.0668	6	28.880	31.040	0.0885	8	17.024	14.241
751	0.0338	3	20.017	15.186	0.0225	2	39.500	31.113	0.0334	3	80.024	73.402	0.0218	2	42.725	48.755

$$(**)\ SD = \frac{\sum (x_i - \bar{x})}{n-1}$$

TABLE 4.- Stratified mean catches (Kg) and SD of **Greenland halibut** by stratum and year (2003-2012). Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2012.

	Survey									
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
385	0.00	710.95	-	1855.08	1976.50	2125.24	587.05	147.50	1545.80	9.09
387	4067.84	16780.80	-	13440.00	7948.80	11906.69	8465.92	6105.15	3085.44	3170.62
388	7450.59	15243.90	-	16930.37	17862.78	11377.52	4791.15	6998.06	2967.74	4051.16
389	233.76	2936.93	-	16767.19	19073.88	21691.69	10057.48	5163.08	5806.67	15885.89
390	16.30	0.00	-	10567.88	5259.74	4187.33	1272.22	137.14	221.50	445.19
391	88.36	1610.22	-	4972.37	4441.50	6452.72	1365.02	1797.75	702.67	3927.91
392	1812.50	2262.00	-	1000.50	6140.75	1648.65	1926.91	1506.55	2091.63	2283.75
729	6483.96	5673.00	-	4486.32	4593.27	3326.92	4482.35	3856.40	1678.09	2357.24
730	4148.00	1300.50	-	1428.57	822.80	6932.03	5111.33	3478.77	1322.09	868.70
731	7851.60	5888.16	-	3594.96	6760.51	9185.76	4839.12	8546.40	883.51	2690.64
732	9956.10	2552.55	-	1517.67	2274.58	9904.70	11118.61	13093.66	4952.58	4361.28
733	n.s.	4266.60	-	4342.16	5758.74	7436.52	8585.81	8691.35	2467.00	2540.48
734	n.s.	3146.70	-	685.06	709.69	1163.18	9004.05	4957.20	1720.18	2399.04
741	2720.00	1151.67	-	564.75	459.00	700.50	3543.50	2923.50	1925.50	2551.00
742	2035.20	1990.40	-	677.92	302.56	922.88	2492.80	3682.56	738.88	1448.96
743	n.s.	447.02	-	242.25	557.18	329.46	1234.38	2548.73	1182.44	444.34
744	n.s.	495.00	-	694.32	1898.82	1540.77	2058.54	3246.21	1696.86	1015.74
745	3828.00	4500.80	-	2514.88	2970.59	7273.20	10348.82	11367.77	9369.03	11334.36
746	11564.98	3737.07	-	2223.29	2730.28	22281.93	9042.92	16205.28	5632.73	4660.23
747	n.s.	366.83	-	3133.67	3995.56	10382.88	8198.79	8901.58	6266.04	7617.93
748	2178.30	1013.63	-	545.11	1027.14	2162.40	10676.85	2965.35	2187.05	903.12
749	1076.04	825.30	-	535.50	505.26	2604.42	2551.50	1359.54	1977.57	977.13
750	n.s.	0.00	-	5582.86	5205.09	8166.95	8288.21	25152.05	16057.28	9465.55
751	n.s.	n.s.	-	1046.53	4671.60	4592.14	4583.82	9045.50	18325.42	9784.03
TOTAL	65511.53	76900.01	-	99349.19	107946.61	158296.49	134627.15	151877.06	94803.69	95193.38
$(\overline{y})$	14.64	12.29	-	15.32	16.64	24.40	20.75	23.41	14.61	14.67
SD	1.09	0.59	-	0.95	1.33	2.12	1.68	1.92	1.97	1.55

TABLE 5.- Survey estimates (by the swept area method) of **Greenland halibut** biomass (t.) and SD by stratum and year on NAFO Div. 3L (R/V *Vizconde de Eza*). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2012.

	Survey									
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
385	0	62	-	162	176	186	52	13	135	1
387	356	1570	-	1195	707	1095	772	534	274	282
388	670	1452	-	1495	1588	1018	432	614	264	355
389	21	261	-	1476	1695	1947	877	455	516	1392
390	1	0	-	931	468	360	111	12	20	39
391	8	148	-	442	395	569	119	158	61	343
392	156	212	-	87	546	149	168	134	183	203
729	618	513	-	399	408	296	394	343	149	210
730	375	118	-	131	73	645	454	313	119	77
731	686	507	-	316	601	835	425	760	79	237
732	885	243	-	136	202	888	988	1164	437	384
733	n.s.	388	-	383	512	690	763	773	217	224
734	n.s.	311	-	61	63	105	828	441	153	206
741	242	107	-	52	41	67	320	260	177	235
742	175	166	-	59	27	88	233	327	66	141
743	n.s.	48	-	22	50	33	122	227	107	43
744	n.s.	49	-	61	175	139	196	284	153	92
745	337	424	-	220	264	655	926	1010	840	994
746	1037	332	-	198	247	2097	813	1433	497	414
747	n.s.	36	-	280	355	971	734	791	562	679
748	200	102	-	50	91	199	933	264	198	80
749	97	75	-	47	45	244	227	119	179	88
750	n.s.	0	-	500	460	774	733	2236	1443	856
751	n.s.	n.s.	-	92	415	445	407	804	1647	900
TOTAL	5863	7121	-	8795	9603	14494	12030	13466	8477	8476
SD	445	325	-	551	769	1223	979	1107	1147	909

Table 6.- Length-weight relationships in the calculation of biomass, for Division 3L (out ZEE Canada), 2003-2012 for **Greenland halibut, American plaice** and **witch flounder**. The equation is Weight=a(Length+0.5)^b. To calculate the parameters for the indeterminate individuals, we used the total data (males+females+indeterminate individuals).

	Greenland halibut,				American plaice				Witch flounder			
Year	Sex	L-W Equations	N	r^2	Sex	L-W Equations	N	r^2	Sex	L-W Equations	N	r^2
2003	All	$W = 0.0020\ L^{3.3855}$	429	0.9897	All	$W = 0.0018\ L^{3.4328}$	725	0.9873	All	$W = 0.0019\ L^{3.3452}$	96	0.9883
	Males	$W = 0.0020\ L^{3.3776}$	231	0.9858	Males	$W = 0.0025\ L^{3.3191}$	205	0.9813	Males	$W = 0.0018\ L^{3.3564}$	39	0.9901
	Females	$W = 0.0020\ L^{3.3914}$	198	0.9922	Females	$W = 0.0016\ L^{3.4755}$	516	0.9887	Females	$W = 0.0018\ L^{3.3457}$	55	0.9861
2004	All	$W = 0.0025\ L^{3.3067}$	724	0.9817	All	$W = 0.0026\ L^{3.4033}$	515	0.9808	All	$W = 0.0013\ L^{3.4496}$	139	0.9888
	Males	$W = 0.0021\ L^{3.3591}$	335	0.9886	Males	$W = 0.0045\ L^{3.1673}$	142	0.9473	Males	$W = 0.0009\ L^{3.5684}$	51	0.9796
	Females	$W = 0.0030\ L^{3.2628}$	389	0.9769	Females	$W = 0.0022\ L^{3.4001}$	373	0.9856	Females	$W = 0.0013\ L^{3.4636}$	72	0.9907
2006	All	$W = 0.0021\ L^{3.3631}$	1220	0.9835	All	$W = 0.0025\ L^{3.3723}$	759	0.9784	All	$W = 0.0026\ L^{3.2619}$	193	0.9694
	Males	$W = 0.0019\ L^{3.3863}$	583	0.9831	Males	$W = 0.0026\ L^{3.3615}$	267	0.9629	Males	$W = 0.0046\ L^{3.0994}$	65	0.963
	Females	$W = 0.0023\ L^{3.3342}$	637	0.9835	Females	$W = 0.0031\ L^{3.3146}$	486	0.9776	Females	$W = 0.0021\ L^{3.3201}$	123	0.9631
2007	All	$W = 0.0033\ L^{3.2385}$	1544	0.989	All	$W = 0.0024\ L^{3.3710}$	1276	0.9873	All	$W = 0.0023\ L^{3.3024}$	249	0.9776
	Males	$W = 0.0032\ L^{3.2464}$	694	0.9876	Males	$W = 0.0026\ L^{3.3456}$	444	0.9734	Males	$W = 0.0033\ L^{3.1948}$	106	0.9618
	Females	$W = 0.0037\ L^{3.2183}$	842	0.9898	Females	$W = 0.0028\ L^{3.3289}$	809	0.991	Females	$W = 0.0025\ L^{3.2803}$	135	0.988
2008	All	$W = 0.0037\ L^{3.2060}$	1704	0.99	All	$W = 0.0044\ L^{3.2282}$	1196	0.9894	All	$W = 0.0031\ L^{3.2244}$	381	0.9844
	Males	$W = 0.0036\ L^{3.2070}$	700	0.989	Males	$W = 0.0057\ L^{3.1501}$	386	0.9853	Males	$W = 0.0028\ L^{3.2523}$	147	0.986
	Females	$W = 0.0038\ L^{3.2008}$	998	0.99	Females	$W = 0.0042\ L^{3.2366}$	773	0.9931	Females	$W = 0.0031\ L^{3.2241}$	210	0.9882
2009	All	$W = 0.0032\ L^{3.2445}$	1407	0.9945	All	$W = 0.0038\ L^{3.2226}$	812	0.9890	All	$W = 0.0020\ L^{3.3367}$	221	0.9906
	Males	$W = 0.0030\ L^{3.2546}$	568	0.9936	Males	$W = 0.0043\ L^{3.1859}$	263	0.9847	Males	$W = 0.0016\ L^{3.3951}$	74	0.9845
	Females	$W = 0.0034\ L^{3.2303}$	826	0.9954	Females	$W = 0.0037\ L^{3.2324}$	542	0.9881	Females	$W = 0.0018\ L^{3.3712}$	134	0.9891
2010	All	$W = 0.0045\ L^{3.1518}$	1434	0.9898	All	$W = 0.0030\ L^{3.3098}$	975	0.9910	All	$W = 0.0016\ L^{3.4075}$	193	0.9936
	Males	$W = 0.0045\ L^{3.1470}$	609	0.9903	Males	$W = 0.0035\ L^{3.2635}$	288	0.9810	Males	$W = 0.0012\ L^{3.4881}$	55	0.9787
	Females	$W = 0.0048\ L^{3.1409}$	824	0.9897	Females	$W = 0.0030\ L^{3.3045}$	667	0.9927	Females	$W = 0.0015\ L^{3.4199}$	119	0.9923
2011	All	$W = 0.0043\ L^{3.1624}$	1469	0.9948	All	$W = 0.0029\ L^{3.3106}$	1285	0.9914	All	$W = 0.0017\ L^{3.3810}$	193	0.9926
	Males	$W = 0.0045\ L^{3.1411}$	599	0.9946	Males	$W = 0.0036\ L^{3.2430}$	431	0.9848	Males	$W = 0.0016\ L^{3.4021}$	88	0.9858
	Females	$W = 0.0043\ L^{3.1658}$	868	0.9949	Females	$W = 0.0027\ L^{3.3356}$	854	0.9924	Females	$W = 0.0015\ L^{3.4172}$	105	0.9896
2012	All	$W = 0.0053\ L^{3.1125}$	1624	0.9895	All	$W = 0.0033\ L^{3.2658}$	1033	0.9891	All	$W = 0.0024\ L^{3.2947}$	193	0.9872
	Males	$W = 0.0058\ L^{3.0782}$	658	0.9870	Males	$W = 0.0051\ L^{3.1338}$	335	0.9790	Males	$W = 0.0025\ L^{3.2771}$	54	0.9846
	Females	$W = 0.0051\ L^{3.1255}$	966	0.9909	Females	$W = 0.0030\ L^{3.2978}$	682	0.9918	Females	$W = 0.0016\ L^{3.4063}$	139	0.9848

TABLE 7.- Greenland halibut length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2004-2008 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2004				2006				2007				2008			
Length (cm.)	M	F	I	T	M	F	I	T	M	F	I	T	M	F	I	T
6	0.00	0.07	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.01	0.00	0.01	0.02	0.01	0.02	0.02	0.05
10	0.00	0.07	0.00	0.07	0.26	0.08	0.01	0.35	0.16	0.16	0.06	0.38	0.37	0.35	0.12	0.85
12	0.51	0.67	0.10	1.28	2.12	1.48	0.00	3.60	0.94	0.99	0.06	1.99	0.93	1.14	0.14	2.21
14	1.24	1.63	0.00	2.86	2.64	3.18	0.00	5.82	1.09	1.47	0.00	2.56	0.24	0.44	0.05	0.73
16	1.27	1.56	0.02	2.85	1.01	1.38	0.00	2.40	0.26	0.45	0.00	0.72	0.00	0.00	0.00	0.00
18	0.09	0.68	0.00	0.77	0.05	0.15	0.00	0.19	0.06	0.01	0.00	0.07	0.00	0.03	0.00	0.03
20	0.01	0.02	0.00	0.03	0.01	0.01	0.00	0.02	0.02	0.04	0.00	0.06	0.04	0.13	0.00	0.17
22	0.33	0.10	0.00	0.44	0.01	0.09	0.00	0.10	0.19	0.04	0.00	0.23	0.46	0.55	0.00	1.01
24	1.08	0.33	0.00	1.42	0.16	0.08	0.00	0.24	0.42	0.45	0.00	0.88	0.89	1.16	0.00	2.05
26	1.88	0.82	0.00	2.71	0.40	0.35	0.00	0.75	0.60	0.69	0.00	1.29	0.72	1.57	0.00	2.29
28	1.35	1.15	0.00	2.51	0.65	0.74	0.00	1.39	0.35	0.52	0.00	0.88	0.27	0.67	0.00	0.94
30	1.95	1.32	0.00	3.28	0.82	0.70	0.00	1.52	0.21	0.08	0.00	0.29	0.23	0.21	0.00	0.44
32	2.31	1.82	0.00	4.14	0.85	0.79	0.00	1.64	0.55	0.28	0.00	0.83	0.50	0.46	0.00	0.96
34	2.19	2.08	0.00	4.28	1.54	1.36	0.00	2.90	0.88	0.78	0.00	1.66	0.94	0.88	0.00	1.82
36	1.68	2.26	0.00	3.94	1.57	1.62	0.00	3.19	1.22	1.32	0.00	2.54	1.12	1.20	0.00	2.32
38	1.32	1.73	0.00	3.05	1.26	1.92	0.00	3.18	1.43	1.58	0.00	3.01	0.97	1.24	0.00	2.21
40	0.95	1.46	0.00	2.40	1.28	1.72	0.00	2.99	1.31	2.13	0.00	3.45	1.18	1.26	0.00	2.43
42	0.35	0.79	0.00	1.14	1.31	1.56	0.00	2.87	1.11	2.05	0.00	3.16	1.69	2.02	0.00	3.71
44	0.26	0.68	0.00	0.94	0.85	1.69	0.00	2.53	1.02	1.92	0.00	2.94	1.23	2.24	0.00	3.47
46	0.11	0.29	0.00	0.40	0.48	1.02	0.00	1.50	0.69	1.41	0.00	2.09	1.16	2.06	0.00	3.22
48	0.09	0.19	0.00	0.27	0.30	0.81	0.00	1.12	0.34	1.02	0.00	1.37	0.87	2.08	0.00	2.95
50	0.08	0.08	0.00	0.16	0.13	0.42	0.00	0.54	0.15	0.72	0.00	0.86	0.42	1.62	0.00	2.04
52	0.00	0.07	0.00	0.07	0.05	0.28	0.00	0.33	0.16	0.57	0.00	0.74	0.29	1.30	0.00	1.59
54	0.05	0.07	0.00	0.12	0.07	0.17	0.00	0.24	0.06	0.32	0.00	0.38	0.18	0.80	0.00	0.98
56	0.02	0.03	0.00	0.05	0.01	0.07	0.00	0.08	0.03	0.13	0.00	0.16	0.15	0.43	0.00	0.58
58	0.01	0.04	0.00	0.05	0.03	0.06	0.00	0.09	0.03	0.06	0.00	0.09	0.03	0.28	0.00	0.30
60	0.02	0.03	0.00	0.05	0.00	0.08	0.00	0.08	0.01	0.09	0.00	0.10	0.01	0.13	0.00	0.14
62	0.00	0.01	0.00	0.01	0.01	0.02	0.00	0.03	0.00	0.07	0.00	0.07	0.02	0.06	0.00	0.08
64	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08
66	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.05	0.00	0.05
68	0.00	0.04	0.00	0.04	0.00	0.02	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.02	0.00	0.02
70	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.04	0.00	0.04
72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02
74	0.00	0.04	0.00	0.04	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.01	0.00	0.01
78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02
80	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.04	0.00	0.04
82	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
84	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	19.2	20.1	0.1	39.4	17.9	21.9	0.0	39.8	13.3	19.4	0.1	32.9	14.9	24.7	0.3	39.9
Nº samples:				43				94				85				98
Nº Ind.:	935	985	4	1924	1549	1907	1	3457	1205	1761	13	2979	1447	2416	37	3900
Sampled catch:				695				1397				1533				2431
Range:				7-75				9-87				9-80				9-92
Total catch:				695				1397				1533				2431
Total valid hauls:				50				100				94				100

TABLE 8.- Greenland halibut length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2009-2012 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2009				2010				2011				2012			
Length (cm.)	M	F	I	T	M	F	I	T	M	F	I	T	M	F	I	T
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
8	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.03	0.00	0.00	0.00	0.00
10	0.28	0.40	0.11	0.79	0.01	0.04	0.07	0.12	0.00	0.00	0.04	0.04	0.03	0.06	0.00	0.09
12	1.66	2.28	0.20	4.14	0.12	0.16	0.26	0.53	0.10	0.09	0.00	0.18	0.41	0.52	0.01	0.93
14	0.77	1.22	0.01	2.00	0.15	0.17	0.23	0.55	0.52	0.51	0.00	1.03	0.80	0.78	0.00	1.57
16	0.06	0.10	0.00	0.16	0.06	0.03	0.01	0.11	1.20	1.50	0.00	2.70	0.21	0.36	0.00	0.57
18	0.02	0.02	0.00	0.04	0.05	0.04	0.00	0.09	0.32	0.38	0.00	0.70	0.00	0.01	0.00	0.01
20	0.05	0.09	0.00	0.14	0.04	0.17	0.00	0.21	0.09	0.07	0.00	0.16	0.00	0.01	0.00	0.01
22	0.21	0.26	0.00	0.48	0.34	0.43	0.00	0.76	0.27	0.28	0.00	0.54	0.26	0.14	0.00	0.40
24	0.44	0.66	0.00	1.10	0.91	0.98	0.00	1.90	0.38	0.61	0.00	0.99	1.00	1.07	0.00	2.07
26	0.31	0.41	0.00	0.71	0.76	1.00	0.00	1.76	0.37	0.48	0.00	0.85	1.33	2.41	0.00	3.73
28	0.23	0.20	0.00	0.42	0.44	0.42	0.00	0.86	0.24	0.28	0.00	0.51	1.48	2.26	0.00	3.74
30	0.56	0.29	0.00	0.85	0.23	0.18	0.00	0.41	0.24	0.21	0.00	0.45	0.69	1.22	0.00	1.91
32	0.62	0.96	0.00	1.59	0.53	0.57	0.00	1.11	0.25	0.44	0.00	0.69	0.34	0.52	0.00	0.86
34	0.88	1.28	0.00	2.17	0.67	0.73	0.00	1.41	0.42	0.41	0.00	0.84	0.42	0.60	0.00	1.01
36	0.90	1.09	0.00	1.99	1.01	0.99	0.00	1.99	0.46	0.55	0.00	1.01	0.52	0.57	0.00	1.09
38	0.91	1.18	0.00	2.09	1.28	1.24	0.00	2.52	0.64	0.51	0.00	1.14	0.56	0.75	0.00	1.31
40	0.92	1.67	0.00	2.59	1.31	1.82	0.00	3.14	0.60	0.85	0.00	1.45	0.82	0.80	0.00	1.62
42	0.85	1.63	0.00	2.48	1.14	1.72	0.00	2.86	0.65	0.82	0.00	1.48	0.80	1.14	0.00	1.94
44	0.88	1.65	0.00	2.53	0.86	1.49	0.00	2.35	0.54	0.95	0.00	1.49	0.54	1.07	0.00	1.61
46	0.82	1.47	0.00	2.29	0.80	1.48	0.00	2.28	0.56	0.88	0.00	1.43	0.40	0.90	0.00	1.30
48	0.59	1.81	0.00	2.39	0.81	1.40	0.00	2.21	0.43	0.83	0.00	1.26	0.41	0.92	0.00	1.33
50	0.37	1.13	0.00	1.50	0.50	1.19	0.00	1.68	0.28	0.73	0.00	1.02	0.36	0.52	0.00	0.88
52	0.23	1.13	0.00	1.36	0.38	1.08	0.00	1.45	0.30	0.71	0.00	1.01	0.28	0.48	0.00	0.76
54	0.13	0.82	0.00	0.95	0.24	0.99	0.00	1.23	0.15	0.61	0.00	0.76	0.18	0.35	0.00	0.52
56	0.07	0.57	0.00	0.64	0.11	0.84	0.00	0.95	0.13	0.48	0.00	0.61	0.11	0.25	0.00	0.36
58	0.02	0.31	0.00	0.32	0.00	0.56	0.00	0.56	0.03	0.44	0.00	0.47	0.02	0.26	0.00	0.28
60	0.02	0.28	0.00	0.30	0.04	0.34	0.00	0.38	0.01	0.28	0.00	0.29	0.02	0.17	0.00	0.19
62	0.00	0.15	0.00	0.15	0.00	0.20	0.00	0.20	0.00	0.19	0.00	0.19	0.01	0.12	0.00	0.13
64	0.00	0.09	0.00	0.09	0.00	0.11	0.00	0.11	0.00	0.18	0.00	0.18	0.01	0.11	0.00	0.13
66	0.00	0.03	0.00	0.03	0.00	0.07	0.00	0.07	0.00	0.08	0.00	0.08	0.00	0.06	0.00	0.06
68	0.01	0.01	0.00	0.02	0.00	0.06	0.00	0.06	0.00	0.02	0.00	0.02	0.00	0.13	0.00	0.13
70	0.00	0.01	0.00	0.01	0.00	0.04	0.00	0.04	0.00	0.06	0.00	0.06	0.00	0.03	0.00	0.03
72	0.00	0.04	0.00	0.04	0.00	0.03	0.00	0.03	0.00	0.04	0.00	0.04	0.00	0.00	0.00	0.00
74	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.03	0.00	0.03	0.00	0.02	0.00	0.02
76	0.00	0.02	0.00	0.02	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00
78	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01
82	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	0.00	0.02	0.00	0.02	0.00	0.04	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	12.8	23.3	0.3	36.5	12.8	20.7	0.6	34.0	9.2	14.5	0.1	23.8	12.0	18.6	0.0	30.6
Nº samples:				96				88				82				94
Nº Ind.:	1256	2298	31	3585	1275	2055	42	3372	813	1275	4	2092	966	1503	1	2470
Sampled catch:				2098				2403				1319				1319
Range:				9-85				10-94				7-80				7-80
Total catch:				2098				2403				1319				1392
Total valid hauls:				98				97				89				89

TABLE 9.- Swept area, number of hauls and **American plaice** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2012, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2012. n.s. means stratum not surveyed.

Stratum	2003 (*)				2004				2006				2007				2008			
	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD
385	0.0225	2	3.985	2.920	0.0229	2	19.100	15.132	0.0229	2	48.530	33.757	0.0225	2	31.925	7.955	0.0229	2	64.750	60.033
387	0.0229	2	3.850	4.031	0.0214	2	17.810	2.814	0.0225	2	6.653	5.533	0.0225	2	7.992	2.039	0.0435	4	5.906	4.512
388	0.0334	3	7.317	2.249	0.0105	1	13.450	-	0.0566	5	7.618	2.653	0.0563	5	8.390	2.267	0.0559	5	2.925	1.905
389	0.0454	4	6.455	2.150	0.0225	2	8.950	4.073	0.0795	7	20.584	12.793	0.0900	8	25.475	13.677	0.0780	7	12.982	11.014
390	0.0563	5	1.854	1.584	0.0345	3	27.777	14.246	0.1249	11	76.086	51.616	0.1350	12	69.235	50.977	0.1395	12	117.141	134.128
391	0.0338	3	6.207	1.670	0.0218	2	14.890	3.125	0.0450	4	10.585	9.713	0.0450	4	37.163	30.535	0.0454	4	20.580	28.816
392	0.0116	1	8.400	-	0.0214	2	0.300	0.424	0.0229	2	0.000	0.000	0.0225	2	1.055	0.658	0.0221	2	0.000	0.000
729	0.0210	2	55.190	19.643	0.0221	2	0.150	0.212	0.0338	3	0.000	0.000	0.0338	3	0.000	0.000	0.0338	3	0.000	0.000
730	0.0221	2	59.000	21.779	0.0221	2	0.000	0.000	0.0326	3	0.000	0.000	0.0225	2	0.000	0.000	0.0323	3	0.000	0.000
731	0.0229	2	25.610	11.017	0.0233	2	1.450	2.051	0.0341	3	0.000	0.000	0.0338	3	0.253	0.439	0.0330	3	0.327	0.566
732	0.0113	1	40.700	-	0.0210	2	0.000	0.000	0.0334	3	0.000	0.000	0.0338	3	0.000	0.000	0.0446	4	0.000	0.000
733	n.s.	n.s.	n.s.	n.s.	0.0330	3	1.267	1.186	0.0454	4	0.000	0.000	0.0338	3	0.320	0.554	0.0431	4	0.426	0.762
734	n.s.	n.s.	n.s.	n.s.	0.0304	3	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0221	2	0.066	0.093
741	0.0113	1	0.000	-	0.0323	3	0.000	0.000	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000
742	0.0116	1	0.000	-	0.0120	1	0.000	-	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000
743	n.s.	n.s.	n.s.	n.s.	0.0188	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0203	2	0.000	0.000
744	n.s.	n.s.	n.s.	n.s.	0.0101	1	0.000	-	0.0229	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000
745	0.0341	3	0.610	0.849	0.0319	3	0.000	0.000	0.0686	6	0.000	0.000	0.0675	6	0.000	0.000	0.0555	5	0.000	0.000
746	0.0446	4	0.000	0.000	0.0338	3	0.000	0.000	0.0675	6	0.000	0.000	0.0664	6	0.000	0.000	0.0638	6	0.000	0.000
747	n.s.	n.s.	n.s.	n.s.	0.0308	3	0.000	0.000	0.1230	11	0.000	0.000	0.1238	11	0.000	0.000	0.1069	10	0.000	0.000
748	0.0109	1	1.010	-	0.0199	2	0.000	0.000	0.0326	3	0.000	0.000	0.0338	3	0.000	0.000	0.0218	2	0.000	0.000
749	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000	0.0229	2	0.000	0.000	0.0113	1	0.000	-	0.0214	2	0.000	0.000
750	n.s.	n.s.	n.s.	n.s.	0.0180	2	0.000	0.000	0.1005	9	0.000	0.000	0.0679	6	0.000	0.000	0.0844	8	0.000	0.000
751	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s	n.s	0.0454	4	0.000	0.000	0.0225	2	0.000	0.000	0.0413	4	0.000	0.000

$$(**)\ SD = \frac{\sum (x_i - \bar{x})}{n-1}$$

TABLE 9 (cont).- Swept area, number of hauls and **American plaice** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2012, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2012. n.s. means stratum not surveyed.

Stratum	2009				2010				2011				2012			
	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
385	0.0225	2	561.169	81.785	0.0225	2	2.761	1.119	0.0229	2	202.650	197.071	0.0225	2	193.475	181.974
387	0.0439	4	6.887	2.182	0.0458	4	1.394	2.182	0.0450	4	3.587	2.776	0.0450	4	2.416	2.024
388	0.0555	5	3.681	4.233	0.0570	5	22.107	36.161	0.0563	5	2.976	3.120	0.0570	5	1.936	1.593
389	0.0803	7	24.644	25.370	0.0795	7	35.954	30.883	0.0675	6	9.284	6.823	0.0799	7	29.401	19.170
390	0.1373	12	114.493	164.475	0.1249	11	9.692	8.751	0.1009	9	54.052	27.065	0.1354	12	97.008	63.776
391	0.0458	4	9.601	7.900	0.0454	4	0.526	0.744	0.0458	4	21.830	22.495	0.0458	4	31.398	44.843
392	0.0229	2	1.060	0.905	0.0225	2	0.000	0.000	0.0229	2	0.545	0.771	0.0225	2	0.013	0.018
729	0.0341	3	0.020	0.035	0.0338	3	0.000	0.000	0.0338	3	0.107	0.185	0.0338	3	0.000	0.000
730	0.0338	3	0.194	0.335	0.0334	3	0.000	0.000	0.0334	3	0.000	0.000	0.0338	3	0.000	0.000
731	0.0341	3	0.104	0.179	0.0338	3	0.000	0.000	0.0334	3	0.000	0.000	0.0341	3	0.040	0.069
732	0.0450	4	0.000	0.000	0.0450	4	0.039	0.057	0.0454	4	0.000	0.000	0.0454	4	0.000	0.000
733	0.0450	4	0.018	0.036	0.0450	4	0.555	0.785	0.0454	4	0.025	0.049	0.0454	4	0.071	0.110
734	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0233	2	0.000	0.000
741	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0218	2	0.000	0.000	0.0218	2	0.000	0.000
742	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0206	2	0.000	0.000
743	0.0203	2	0.000	0.000	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0206	2	0.000	0.000
744	0.0210	2	0.000	0.000	0.0229	2	0.000	0.000	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000
745	0.0559	5	0.000	0.000	0.0563	5	0.000	0.000	0.0446	4	0.000	0.000	0.0570	5	0.000	0.000
746	0.0668	6	0.065	0.159	0.0679	6	0.000	0.000	0.0566	5	0.000	0.000	0.0675	6	0.000	0.000
747	0.1118	10	0.000	0.000	0.1125	10	0.000	0.000	0.0893	8	0.000	0.000	0.1121	10	0.000	0.000
748	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000
749	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000
750	0.0791	7	0.000	0.000	0.0900	8	0.000	0.000	0.0668	6	0.000	0.000	0.0885	8	0.000	0.000
751	0.0338	3	0.000	0.000	0.0225	2	0.000	0.000	0.0334	3	0.000	0.000	0.0218	2	0.000	0.000

$$(**)\ SD = \frac{\sum (x_i - \bar{x})}{n-1}$$

TABLE 10.- Stratified mean catches (Kg) and SD of **American plaice** by stratum and year (2003-2012). Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2012.

	Survey									
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
385	470.23	2253.80	-	5726.54	3767.15	7640.50	66217.94	325.80	23912.70	22830.05
387	985.60	4559.36	-	1703.04	2045.95	1511.87	1763.14	356.97	918.27	618.37
388	2612.05	4801.65	-	2719.48	2995.09	1044.23	1314.12	7892.20	1062.36	691.15
389	3285.60	4555.55	-	10477.26	12966.65	6608.06	12543.72	18300.40	4725.39	14965.33
390	1511.01	22637.98	-	62010.39	56426.39	95469.71	93311.86	7899.18	44052.56	79061.11
391	1750.28	4198.98	-	2984.97	10479.83	5803.56	2707.34	148.33	6156.13	8854.31
392	1218.00	43.50	-	0.00	152.90	0.00	153.70	0.00	79.03	1.81
729	10265.34	27.90	-	0.00	0.00	0.00	3.72	0.00	19.84	0.00
730	10030.00	0.00	-	0.00	0.00	0.00	32.92	0.00	0.00	0.00
731	5531.76	313.20	-	0.00	54.72	70.56	22.54	0.00	0.00	8.64
732	9401.70	0.00	-	0.00	0.00	0.00	0.00	9.07	0.00	0.00
733	n.s	296.40	-	0.00	74.88	99.68	4.15	129.87	5.73	16.50
734	n.s	0.00	-	0.00	0.00	10.10	0.00	0.00	0.00	0.00
741	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
742	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
743	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
744	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
745	212.28	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
746	0.00	0.00	-	0.00	0.00	0.00	25.48	0.00	0.00	0.00
747	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
748	160.59	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
749	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
750	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
751	n.s	n.s	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	47434.44	43688.32	-	85621.68	88963.55	118258.27	178100.64	35061.82	80932.01	127047.27
	10.60	6.98	-	13.20	13.71	18.23	27.46	5.40	12.48	19.58
SD	0.95	1.12	-	2.06	2.00	4.98	6.11	1.32	2.83	3.48

TABLE 11.- Survey estimates (by the swept area method) of **American plaice** biomass (t.) and SD by stratum and year on NAFO Div. 3L (R/V *Vizconde de Eza*). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2012.

	Survey									
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
385	42	197	-	501	335	668	5886	685	2091	2029
387	86	427	-	151	182	139	161	54	82	55
388	235	457	-	240	266	93	118	44	94	61
389	290	405	-	923	1153	593	1094	991	420	1312
390	134	1969	-	5462	5016	8212	8158	2581	3930	7008
391	156	386	-	265	932	512	237	241	538	774
392	105	4	-	0	14	0	13	7	7	0
729	978	3	-	0	0	0	0	0	2	0
730	907	0	-	0	0	0	3	0	0	0
731	484	27	-	0	5	6	2	0	0	1
732	836	0	-	0	0	0	0	0	0	0
733	n.s	27	-	0	7	9	0	1	1	1
734	n.s	0	-	0	0	1	0	8	0	0
741	0	0	-	0	0	0	0	0	0	0
742	0	0	-	0	0	0	0	0	0	0
743	n.s	0	-	0	0	0	0	0	0	0
744	n.s	0	-	0	0	0	0	0	0	0
745	19	0	-	0	0	0	0	0	0	0
746	0	0	-	0	0	0	2	0	0	0
747	n.s	0	-	0	0	0	0	0	0	0
748	15	0	-	0	0	0	0	0	0	0
749	0	0	-	0	0	0	0	0	0	0
750	n.s	0	-	0	0	0	0	0	0	0
751	n.s	n.s	-	0	0	0	0	0	0	0
TOTAL	4284	3901	-	7542	7908	10234	15676	4611	7165	11241
SD	362	626	-	1150	1156	2805	3411	925	1580	2006

TABLE 12.- American plaice length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2004-2008 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2004				2006				2007				2008			
Length (cm.)	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
2	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.10	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00
6	0.05	0.00	0.00	0.05	0.02	0.02	0.29	0.33	0.02	0.00	1.10	1.12	0.00	0.00	0.76	0.76
8	0.04	0.00	0.06	0.10	0.23	0.10	1.28	1.62	0.06	0.02	0.73	0.82	0.01	0.02	0.87	0.90
10	0.09	0.09	0.19	0.37	0.07	0.05	0.02	0.14	0.36	0.33	0.03	0.72	0.55	0.39	0.05	0.99
12	0.03	0.42	0.06	0.52	1.10	1.39	0.00	2.49	2.67	2.75	0.00	5.43	3.49	3.58	0.06	7.13
14	0.65	0.56	0.31	1.52	1.87	2.18	0.00	4.05	2.16	2.08	0.00	4.24	1.95	2.05	0.00	4.00
16	0.62	0.81	0.00	1.43	0.56	0.80	0.00	1.36	1.14	1.79	0.00	2.93	0.86	1.36	0.00	2.22
18	0.59	1.37	0.00	1.96	0.34	0.63	0.00	0.97	1.72	3.00	0.00	4.72	1.45	2.22	0.00	3.67
20	0.43	2.85	0.00	3.29	0.42	0.60	0.00	1.03	1.19	2.15	0.00	3.34	0.92	2.03	0.00	2.94
22	0.71	4.01	0.00	4.73	0.66	1.06	0.00	1.72	0.52	1.28	0.00	1.80	0.94	2.10	0.00	3.04
24	0.88	4.92	0.00	5.79	0.56	1.28	0.00	1.85	0.68	1.36	0.00	2.04	1.12	1.96	0.00	3.08
26	0.32	3.80	0.00	4.12	0.47	1.47	0.02	1.96	0.63	1.50	0.00	2.13	0.94	1.68	0.00	2.62
28	0.34	2.16	0.00	2.50	0.48	2.43	0.00	2.91	0.53	1.52	0.00	2.05	0.75	1.70	0.00	2.46
30	0.06	0.94	0.00	1.00	0.35	2.95	0.00	3.30	0.29	1.65	0.00	1.94	0.56	1.26	0.00	1.81
32	0.04	0.55	0.00	0.59	0.34	2.59	0.00	2.93	0.18	2.14	0.00	2.32	0.62	1.00	0.00	1.63
34	0.04	0.45	0.00	0.49	0.20	2.57	0.00	2.77	0.16	2.87	0.00	3.03	0.46	0.83	0.00	1.30
36	0.00	0.51	0.00	0.51	0.20	1.90	0.00	2.10	0.20	2.45	0.00	2.65	0.44	1.45	0.00	1.89
38	0.00	0.47	0.00	0.47	0.09	1.15	0.00	1.24	0.08	2.29	0.00	2.38	0.35	1.89	0.00	2.23
40	0.12	0.68	0.00	0.80	0.02	0.74	0.00	0.75	0.04	1.83	0.00	1.88	0.12	2.43	0.00	2.55
42	0.00	0.70	0.00	0.70	0.01	0.74	0.00	0.76	0.00	1.23	0.00	1.23	0.07	2.41	0.00	2.48
44	0.00	0.43	0.00	0.43	0.02	1.00	0.00	1.02	0.01	0.90	0.00	0.91	0.00	1.88	0.00	1.88
46	0.00	0.62	0.00	0.62	0.02	1.01	0.00	1.03	0.02	0.74	0.00	0.77	0.00	1.59	0.00	1.59
48	0.00	0.20	0.00	0.20	0.03	1.11	0.00	1.15	0.00	0.57	0.00	0.57	0.00	1.09	0.00	1.09
50	0.00	0.17	0.00	0.17	0.02	0.50	0.00	0.52	0.02	0.60	0.00	0.63	0.00	0.83	0.00	0.83
52	0.00	0.02	0.00	0.02	0.00	0.50	0.00	0.50	0.01	0.35	0.00	0.36	0.00	0.66	0.00	0.66
54	0.00	0.02	0.00	0.02	0.00	0.15	0.00	0.15	0.00	0.23	0.00	0.23	0.00	0.34	0.00	0.34
56	0.00	0.02	0.00	0.02	0.00	0.07	0.00	0.07	0.00	0.09	0.00	0.09	0.00	0.04	0.00	0.04
58	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.10	0.00	0.10	0.00	0.04	0.00	0.04
60	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.04	0.00	0.04
62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Total	5.02	26.77	0.62	32.41	8.20	29.04	1.62	38.86	12.72	35.86	1.88	50.46	15.61	36.88	1.75	54.24
Nº samples:				17				31				37				37
Nº Ind.:	178	846	10	1034	704	2441	136	3281	1129	3116	179	4424	924	2383	98	3405
Sampled catch:				226				1172				1309				1749
Range:				7-57				3-60				4-63				6-61
Total catch:				226				1172				1309				1749
Total valid hauls:				50				100				94				100

TABLE 13.- American plaice length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2009-2012 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2009				2010				2011				2012			
Length (cm.)	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.06	0.04	0.15	0.25	0.20	0.10	0.97	1.28	0.00	0.00	0.00	0.00	0.00	0.03	0.30	0.32
8	0.22	0.12	0.07	0.41	0.22	0.26	0.76	1.24	0.04	0.00	0.00	0.04	0.36	0.16	0.54	1.06
10	4.28	3.78	0.09	8.15	0.49	0.58	0.17	1.25	0.56	0.76	0.00	1.32	0.07	0.07	0.11	0.26
12	3.28	3.70	0.01	6.99	1.60	1.48	0.03	3.10	5.41	5.60	0.00	11.01	0.08	0.09	0.00	0.17
14	2.29	4.64	0.01	6.95	1.05	2.29	0.00	3.34	3.77	5.50	0.00	9.28	2.68	2.16	0.00	4.84
16	3.81	7.38	0.00	11.19	1.27	1.93	0.00	3.20	2.07	2.98	0.00	5.05	6.60	7.80	0.00	14.40
18	1.42	2.83	0.00	4.26	0.78	1.76	0.00	2.54	2.00	3.42	0.00	5.43	3.60	6.55	0.00	10.15
20	1.07	3.16	0.00	4.23	0.78	2.20	0.00	2.98	1.16	3.70	0.00	4.86	3.47	5.47	0.00	8.93
22	0.88	3.30	0.00	4.18	0.33	1.25	0.00	1.58	0.63	2.16	0.00	2.80	1.53	3.88	0.00	5.40
24	0.82	3.04	0.00	3.86	0.19	0.68	0.00	0.87	0.45	3.01	0.00	3.46	1.30	4.96	0.00	6.26
26	1.27	3.98	0.00	5.25	0.23	0.85	0.00	1.08	0.44	1.66	0.00	2.10	1.04	4.99	0.00	6.04
28	1.09	3.71	0.00	4.81	0.21	0.84	0.00	1.05	0.41	1.27	0.00	1.68	0.80	5.05	0.00	5.84
30	0.77	3.61	0.00	4.38	0.20	0.74	0.00	0.94	0.44	1.16	0.00	1.61	0.76	3.35	0.00	4.12
32	0.81	3.21	0.00	4.02	0.11	0.98	0.00	1.08	0.37	1.52	0.00	1.89	0.37	2.53	0.00	2.90
34	0.64	3.33	0.00	3.97	0.07	1.02	0.00	1.08	0.40	2.24	0.00	2.64	0.45	2.31	0.00	2.76
36	0.43	2.47	0.00	2.91	0.09	0.63	0.00	0.72	0.12	2.16	0.00	2.28	0.31	2.58	0.00	2.89
38	0.24	3.29	0.00	3.53	0.02	0.70	0.00	0.71	0.17	2.39	0.00	2.56	0.10	2.55	0.00	2.65
40	0.12	4.41	0.00	4.53	0.02	0.39	0.00	0.41	0.07	1.64	0.00	1.71	0.11	2.16	0.00	2.26
42	0.02	4.78	0.00	4.80	0.02	0.49	0.00	0.51	0.00	1.04	0.00	1.04	0.00	2.11	0.00	2.11
44	0.08	4.09	0.00	4.16	0.01	0.53	0.00	0.53	0.00	1.02	0.00	1.02	0.00	1.61	0.00	1.61
46	0.04	2.20	0.00	2.24	0.00	0.46	0.00	0.46	0.00	0.93	0.00	0.93	0.00	0.94	0.00	0.94
48	0.00	1.62	0.00	1.62	0.00	0.21	0.00	0.21	0.00	0.56	0.00	0.56	0.00	1.20	0.00	1.20
50	0.00	1.13	0.00	1.13	0.02	0.12	0.00	0.14	0.00	0.43	0.00	0.43	0.00	0.70	0.00	0.70
52	0.00	0.73	0.00	0.73	0.00	0.14	0.00	0.14	0.00	0.23	0.00	0.23	0.00	0.71	0.00	0.71
54	0.04	0.40	0.00	0.44	0.00	0.07	0.00	0.07	0.01	0.11	0.00	0.12	0.00	0.16	0.00	0.16
56	0.00	0.13	0.00	0.13	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.05
58	0.00	0.12	0.00	0.12	0.00	0.01	0.00	0.01	0.00	0.05	0.00	0.05	0.00	0.07	0.00	0.07
60	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
62	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Total	23.70	75.22	0.34	99.26	7.90	20.75	1.94	30.58	18.54	45.54	0.00	64.08	23.63	64.27	0.95	88.84
Nº samples:				41				35				33				38
Nº Ind.:	1033	2843	16	3892	740	2014	231	2985	1044	2582	0	3626	1044	2917	35	3996
Sampled catch:				2757				739				1066				1902
Range:				6-59				5-63				9-63				6-60
Total catch:				2757				739				1066				1902
Total valid hauls:				98				97				89				98

TABLE 14.- Swept area, number of hauls and **Witch flounder** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2012, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2012.

Stratum	2003 (*)				2004				2006				2007				2008			
	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD
385	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0229	2	0.240	0.339	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000
387	0.0229	2	0.260	0.368	0.0214	2	2.650	2.263	0.0225	2	3.434	2.996	0.0225	2	1.300	1.399	0.0435	4	3.040	1.153
388	0.0334	3	0.159	0.122	0.0105	1	4.327	-	0.0566	5	0.876	0.480	0.0563	5	1.492	1.300	0.0559	5	1.830	2.034
389	0.0454	4	0.013	0.019	0.0225	2	0.093	0.131	0.0795	7	0.284	0.372	0.0900	8	0.001	0.002	0.0780	7	0.184	0.262
390	0.0563	5	0.000	0.000	0.0345	3	0.000	0.000	0.1249	11	0.079	0.185	0.1350	12	0.000	0.000	0.1395	12	0.105	0.246
391	0.0338	3	0.000	0.000	0.0218	2	0.000	0.000	0.0450	4	0.388	0.775	0.0450	4	0.102	0.204	0.0454	4	1.003	1.551
392	0.0116	1	0.008	-	0.0214	2	0.004	0.006	0.0229	2	0.195	0.276	0.0225	2	1.175	1.300	0.0221	2	1.694	2.336
729	0.0210	2	0.785	1.110	0.0221	2	2.310	0.820	0.0338	3	1.450	1.422	0.0338	3	4.823	3.341	0.0338	3	2.770	3.289
730	0.0221	2	5.105	4.052	0.0221	2	1.885	2.666	0.0326	3	0.460	0.797	0.0225	2	0.000	0.000	0.0323	3	0.743	1.287
731	0.0229	2	1.815	0.969	0.0233	2	3.765	3.373	0.0341	3	3.395	2.651	0.0338	3	3.854	4.324	0.0330	3	3.445	1.075
732	0.0113	1	7.150	-	0.0210	2	2.150	1.131	0.0334	3	1.367	1.623	0.0338	3	0.317	0.548	0.0446	4	2.056	1.827
733	n.s.	n.s.	n.s.	n.s.	0.0330	3	2.489	2.543	0.0454	4	6.706	9.359	0.0338	3	2.052	2.218	0.0431	4	5.530	4.719
734	n.s.	n.s.	n.s.	n.s.	0.0304	3	0.000	0.000	0.0225	2	0.190	0.269	0.0225	2	0.066	0.093	0.0221	2	0.200	0.283
741	0.0113	1	0	-	0.0323	3	0.003	0.003	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000
742	0.0116	1	0	-	0.0120	1	0.000	-	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000
743	n.s.	n.s.	n.s.	n.s.	0.0188	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0203	2	0.000	0.000
744	n.s.	n.s.	n.s.	n.s.	0.0101	1	0.000	-	0.0229	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000
745	0.0341	3	0.377	0.635	0.0319	3	0.000	0.000	0.0686	6	0.000	0.000	0.0675	6	0.002	0.004	0.0555	5	0.000	0.000
746	0.0446	4	0.000	0.000	0.0338	3	0.000	0.000	0.0675	6	0.000	0.000	0.0664	6	0.000	0.000	0.0638	6	0.000	0.000
747	n.s.	n.s.	n.s.	n.s.	0.0308	3	0.007	0.012	0.1230	11	0.000	0.000	0.1238	11	0.000	0.000	0.1069	10	0.000	0.000
748	0.0109	1	0.000	-	0.0199	2	0.002	0.003	0.0326	3	0.021	0.036	0.0338	3	0.000	0.000	0.0218	2	0.000	0.000
749	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000	0.0229	2	0.000	0.000	0.0113	1	0.000	-	0.0214	2	0.000	0.000
750	n.s.	n.s.	n.s.	n.s.	0.0180	2	0.000	0.000	0.1005	9	0.000	0.000	0.0679	6	0.000	0.000	0.0844	8	0.000	0.000
751	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0454	4	0.000	0.000	0.0225	2	0.000	0.000	0.0413	4	0.000	0.000

$$(**)\ SD = \frac{\sum (x_i - \bar{x})}{n-1}$$

TABLE 14 (cont).- Swept area, number of hauls and **Witch flounder** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2012, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2012. n.s. means stratum not surveyed.

Stratum	2009				2010				2011				2012			
	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
385	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0229	2	0.002	0.003	0.0225	2	0.000	0.000
387	0.0439	4	0.177	0.190	0.0439	4	0.177	0.190	0.0450	4	4.647	1.243	0.0450	4	1.152	1.021
388	0.0555	5	1.327	1.272	0.0555	5	1.327	1.272	0.0563	5	1.499	1.958	0.0570	5	1.753	2.631
389	0.0803	7	0.005	0.013	0.0803	7	0.005	0.013	0.0675	6	0.141	0.218	0.0799	7	0.022	0.042
390	0.1373	12	0.000	0.000	0.1373	12	0.000	0.000	0.1009	9	0.000	0.000	0.1354	12	0.000	0.000
391	0.0458	4	0.103	0.198	0.0458	4	0.103	0.198	0.0458	4	0.000	0.000	0.0458	4	0.159	0.317
392	0.0229	2	1.241	1.040	0.0229	2	1.241	1.040	0.0229	2	0.301	0.330	0.0225	2	1.257	1.728
729	0.0341	3	3.187	1.846	0.0341	3	3.187	1.846	0.0338	3	12.221	7.485	0.0338	3	10.497	8.966
730	0.0338	3	0.000	0.000	0.0338	3	0.000	0.000	0.0334	3	0.000	0.000	0.0338	3	0.601	1.042
731	0.0341	3	5.992	2.310	0.0341	3	5.992	2.310	0.0334	3	2.995	1.748	0.0341	3	1.809	2.096
732	0.0450	4	3.131	2.003	0.0450	4	3.131	2.003	0.0454	4	2.574	1.948	0.0454	4	3.391	1.681
733	0.0450	4	7.234	5.816	0.0450	4	7.234	5.816	0.0454	4	2.002	2.408	0.0454	4	2.163	2.459
734	0.0218	2	0.000	0.000	0.0218	2	0.000	0.000	0.0225	2	0.215	0.304	0.0233	2	0.000	0.000
741	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000	0.0218	2	0.002	0.002	0.0218	2	0.000	0.000
742	0.0214	2	0.000	0.000	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000	0.0206	2	0.000	0.000
743	0.0203	2	0.092	0.130	0.0203	2	0.092	0.130	0.0221	2	0.000	0.000	0.0206	2	0.000	0.000
744	0.0210	2	0.000	0.000	0.0210	2	0.000	0.000	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000
745	0.0559	5	0.010	0.022	0.0559	5	0.010	0.022	0.0446	4	0.000	0.000	0.0570	5	0.000	0.000
746	0.0668	6	0.000	0.000	0.0668	6	0.000	0.000	0.0566	5	0.000	0.000	0.0675	6	0.000	0.000
747	0.1118	10	0.000	0.000	0.1118	10	0.000	0.000	0.0893	8	0.000	0.000	0.1121	10	0.000	0.000
748	0.0229	2	0.000	0.000	0.0229	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.002	0.003
749	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000
750	0.0791	7	0.000	0.000	0.0791	7	0.000	0.000	0.0668	6	0.058	0.141	0.0885	8	0.055	0.108
751	0.0338	3	0.000	0.000	0.0225	2	0.000	0.000	0.0334	3	0.000	0.000	0.0218	2	0.000	0.000

$$(**)\ SD = \frac{\sum (x_i - \bar{x})}{n-1}$$

TABLE 15.- Stratified mean catches (Kg) and SD of **Witch flounder Witch flounder** by stratum and year (2003-2012). Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2012.

	Survey									
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
385	0.00	0.00	-	28.32	0.00	0.00	0.00	0.00	0.24	0.00
387	66.56	678.40	-	878.98	332.67	778.18	45.38	393.86	1189.70	294.85
388	56.88	1544.74	-	312.80	532.50	653.38	473.74	709.43	535.00	625.89
389	6.36	47.08	-	144.34	0.38	93.58	2.47	41.59	71.51	11.34
390	0.00	0.00	-	64.46	0.00	85.58	0.00	0.00	0.00	0.00
391	0.00	0.00	-	109.28	28.69	282.71	28.98	125.42	0.00	44.70
392	1.16	0.58	-	28.28	170.30	245.56	179.87	13.70	43.65	182.27
729	146.01	429.66	-	269.70	897.14	515.22	592.78	1370.20	2273.11	1952.50
730	867.85	320.45	-	78.20	0.00	126.37	0.00	87.83	0.00	102.23
731	392.04	813.24	-	733.32	832.46	744.12	1294.34	1758.96	646.92	390.74
732	1651.65	496.65	-	315.70	73.15	474.94	723.32	1281.47	594.65	783.26
733	n.s	582.50	-	1569.26	480.17	1293.90	1692.76	1979.35	468.35	506.08
734	n.s	0.00	-	29.07	10.02	30.60	0.00	9.95	32.90	0.00
741	0.00	0.27	-	0.00	0.00	0.00	0.00	0.00	0.15	0.00
742	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
743	n.s	0.00	-	0.00	0.00	0.00	4.69	0.00	0.00	0.00
744	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
745	131.08	0.00	-	0.00	0.58	0.00	3.48	2.51	0.00	0.00
746	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
747	n.s	4.83	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
748	0.00	0.32	-	3.34	0.00	0.00	0.00	0.00	0.00	0.32
749	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
750	n.s	0.00	-	0.00	0.00	0.00	0.00	12.09	31.97	30.51
751	n.s	n.s	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	3319.59	4918.72	-	4565.04	3358.07	5324.12	5041.81	7786.36	5888.14	4924.70
	0.74	0.79	-	0.70	0.52	0.82	0.78	1.20	0.91	0.76
SD	0.12	0.13	-	0.20	0.12	0.13	0.13	0.24	0.15	0.18

TABLE 16.- Survey estimates (by the swept area method) of **Witch flounder** biomass (t.) and SD by stratum and year on NAFO Div. 3L (R/V *Vizconde de Eza*). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2012.

	Survey								
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
385	0	0	-	2	0	0	0	0	0	0
387	6	63	-	78	30	72	4	34	106	26
388	5	147	-	28	47	58	43	62	48	55
389	1	4	-	13	0	8	0	4	6	1
390	0	0	-	6	0	7	0	0	0	0
391	0	0	-	10	3	25	3	11	0	4
392	0	0	-	2	15	22	16	1	4	16
729	14	39	-	24	80	46	52	122	202	174
730	78	29	-	7	0	12	0	8	0	9
731	34	70	-	64	74	68	114	156	58	34
732	147	47	-	28	7	43	64	114	52	69
733	n.s	53	-	138	43	120	150	176	41	45
734	n.s	0	-	3	1	3	0	1	3	0
741	0	0	-	0	0	0	0	0	0	0
742	0	0	-	0	0	0	0	0	0	0
743	n.s	0	-	0	0	0	0	0	0	0
744	n.s	0	-	0	0	0	0	0	0	0
745	12	0	-	0	0	0	0	0	0	0
746	0	0	-	0	0	0	0	0	0	0
747	n.s	0	-	0	0	0	0	0	0	0
748	0	0	-	0	0	0	0	0	0	0
749	0	0	-	0	0	0	0	0	0	0
750	n.s	0	-	0	0	0	0	1	3	3
751	n.s	n.s	-	0	0	0	0	0	0	0
TOTAL	297	453	-	404	298	483	447	691	523	436
SD	51	75	-	116	71	80	74	137	86	103

TABLE 17.- Witch flounder length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2004-2008 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2004				2006				2007				2008			
Length (cm.)	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
6	0.00	0.00	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
8	0.00	0.00	0.31	0.31	0.02	0.00	0.06	0.09	0.00	0.01	0.02	0.03	0.00	0.01	0.22	0.23
10	0.04	0.00	0.10	0.14	0.03	0.02	0.01	0.07	0.02	0.01	0.05	0.09	0.03	0.01	0.08	0.12
12	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01
14	0.01	0.00	0.07	0.09	0.04	0.01	0.01	0.06	0.01	0.07	0.03	0.11	0.07	0.12	0.04	0.23
16	0.14	0.17	0.06	0.37	0.15	0.18	0.00	0.34	0.03	0.02	0.01	0.07	0.11	0.10	0.02	0.23
18	0.11	0.18	0.06	0.35	0.11	0.15	0.00	0.26	0.02	0.01	0.01	0.04	0.17	0.20	0.00	0.37
20	0.11	0.32	0.00	0.43	0.06	0.07	0.00	0.14	0.04	0.13	0.00	0.17	0.05	0.08	0.00	0.13
22	0.20	0.37	0.00	0.57	0.10	0.32	0.00	0.42	0.12	0.26	0.00	0.38	0.15	0.10	0.00	0.25
24	0.17	0.08	0.00	0.25	0.22	0.31	0.00	0.52	0.22	0.15	0.00	0.37	0.11	0.11	0.00	0.23
26	0.09	0.18	0.00	0.28	0.02	0.11	0.00	0.13	0.14	0.10	0.01	0.25	0.13	0.08	0.00	0.21
28	0.21	0.18	0.00	0.39	0.07	0.09	0.00	0.16	0.32	0.34	0.00	0.66	0.29	0.32	0.00	0.61
30	0.14	0.05	0.00	0.19	0.10	0.22	0.00	0.33	0.12	0.11	0.00	0.23	0.09	0.15	0.00	0.24
32	0.04	0.14	0.00	0.18	0.21	0.24	0.00	0.46	0.03	0.03	0.00	0.07	0.14	0.14	0.00	0.29
34	0.01	0.23	0.00	0.25	0.13	0.12	0.00	0.25	0.03	0.07	0.00	0.10	0.06	0.09	0.00	0.15
36	0.01	0.02	0.00	0.03	0.02	0.05	0.00	0.07	0.03	0.04	0.00	0.08	0.09	0.08	0.00	0.16
38	0.07	0.03	0.00	0.10	0.02	0.13	0.00	0.15	0.02	0.08	0.00	0.10	0.04	0.17	0.00	0.21
40	0.03	0.09	0.00	0.12	0.03	0.09	0.00	0.12	0.02	0.03	0.00	0.05	0.04	0.11	0.00	0.15
42	0.00	0.18	0.00	0.18	0.00	0.07	0.00	0.07	0.02	0.01	0.00	0.03	0.01	0.11	0.00	0.12
44	0.00	0.12	0.00	0.12	0.00	0.07	0.00	0.07	0.00	0.04	0.00	0.04	0.00	0.06	0.00	0.06
46	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.06	0.00	0.06	0.00	0.12	0.00	0.12
48	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
50	0.00	0.03	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
52	0.00	0.09	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.39	2.47	0.68	4.54	1.36	2.31	0.09	3.76	1.21	1.62	0.14	2.97	1.59	2.19	0.38	4.16
Nº samples:				17				32				22				36
Nº Ind.:	70	101	20	191	113	198	8	319	106	139	13	258	159	223	37	419
Sampled catch:				38				64				46				83
Range:				7-53				8-60				9-54				7-54
Total catch:				38				64				46				83
Total valid hauls:				50				100				94				100

TABLE 18- Witch flounder length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2009-2012 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2009				2010				2011				2012			
Length (cm.)	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
6	0.00	0.00	0.07	0.07	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
8	0.00	0.00	0.07	0.07	0.00	0.00	0.18	0.18	0.00	0.01	0.06	0.07	0.00	0.00	0.07	0.07
10	0.00	0.00	0.01	0.01	0.00	0.02	0.04	0.06	0.00	0.00	0.04	0.04	0.00	0.00	0.01	0.01
12	0.01	0.01	0.00	0.02	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.02	0.02	0.00	0.01	0.03
14	0.03	0.05	0.00	0.08	0.06	0.06	0.02	0.15	0.03	0.03	0.00	0.06	0.04	0.07	0.00	0.11
16	0.03	0.04	0.00	0.07	0.05	0.05	0.00	0.10	0.04	0.02	0.00	0.06	0.02	0.11	0.01	0.14
18	0.04	0.05	0.00	0.09	0.00	0.03	0.01	0.04	0.07	0.03	0.00	0.11	0.00	0.03	0.00	0.03
20	0.01	0.07	0.00	0.08	0.03	0.05	0.00	0.08	0.06	0.03	0.00	0.09	0.03	0.02	0.00	0.05
22	0.11	0.10	0.00	0.21	0.10	0.09	0.00	0.19	0.08	0.09	0.00	0.17	0.01	0.07	0.00	0.08
24	0.07	0.15	0.00	0.22	0.13	0.19	0.00	0.33	0.04	0.06	0.00	0.10	0.04	0.03	0.00	0.07
26	0.07	0.10	0.00	0.17	0.15	0.12	0.00	0.27	0.07	0.09	0.00	0.16	0.04	0.12	0.00	0.15
28	0.07	0.16	0.00	0.23	0.30	0.24	0.00	0.55	0.07	0.20	0.00	0.27	0.05	0.10	0.00	0.15
30	0.15	0.15	0.00	0.30	0.34	0.24	0.00	0.58	0.19	0.19	0.00	0.38	0.05	0.11	0.00	0.16
32	0.23	0.16	0.00	0.40	0.12	0.21	0.00	0.32	0.16	0.14	0.00	0.30	0.06	0.08	0.00	0.14
34	0.10	0.16	0.00	0.26	0.08	0.23	0.00	0.31	0.07	0.19	0.00	0.27	0.03	0.08	0.00	0.11
36	0.05	0.15	0.00	0.20	0.11	0.23	0.00	0.33	0.03	0.09	0.00	0.12	0.08	0.12	0.00	0.20
38	0.08	0.12	0.00	0.20	0.10	0.17	0.00	0.27	0.05	0.20	0.00	0.25	0.06	0.18	0.00	0.24
40	0.02	0.13	0.00	0.15	0.10	0.27	0.00	0.37	0.04	0.16	0.00	0.20	0.02	0.15	0.00	0.17
42	0.01	0.14	0.00	0.15	0.02	0.16	0.00	0.18	0.03	0.15	0.00	0.18	0.02	0.23	0.00	0.25
44	0.01	0.04	0.00	0.05	0.00	0.11	0.00	0.11	0.00	0.19	0.00	0.19	0.00	0.11	0.00	0.11
46	0.00	0.10	0.00	0.10	0.00	0.07	0.00	0.07	0.00	0.07	0.00	0.07	0.00	0.09	0.00	0.09
48	0.00	0.04	0.00	0.04	0.00	0.06	0.00	0.06	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.03
50	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.00	0.00	0.00	0.00
54	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.11	1.93	0.15	3.18	1.69	2.65	0.28	4.62	1.04	2.03	0.10	3.17	0.56	1.75	0.14	2.44
Nº samples:				28				35				29				31
Nº Ind.:	110	193	13	316	169	272	25	466	103	206	10	319	56	178	12	246
Sampled catch:				80				123				92				78
Range:				6-50				6-55				8-53				7-56
Total catch:				80				123				92				78
Total valid hauls:				98				97				89				98

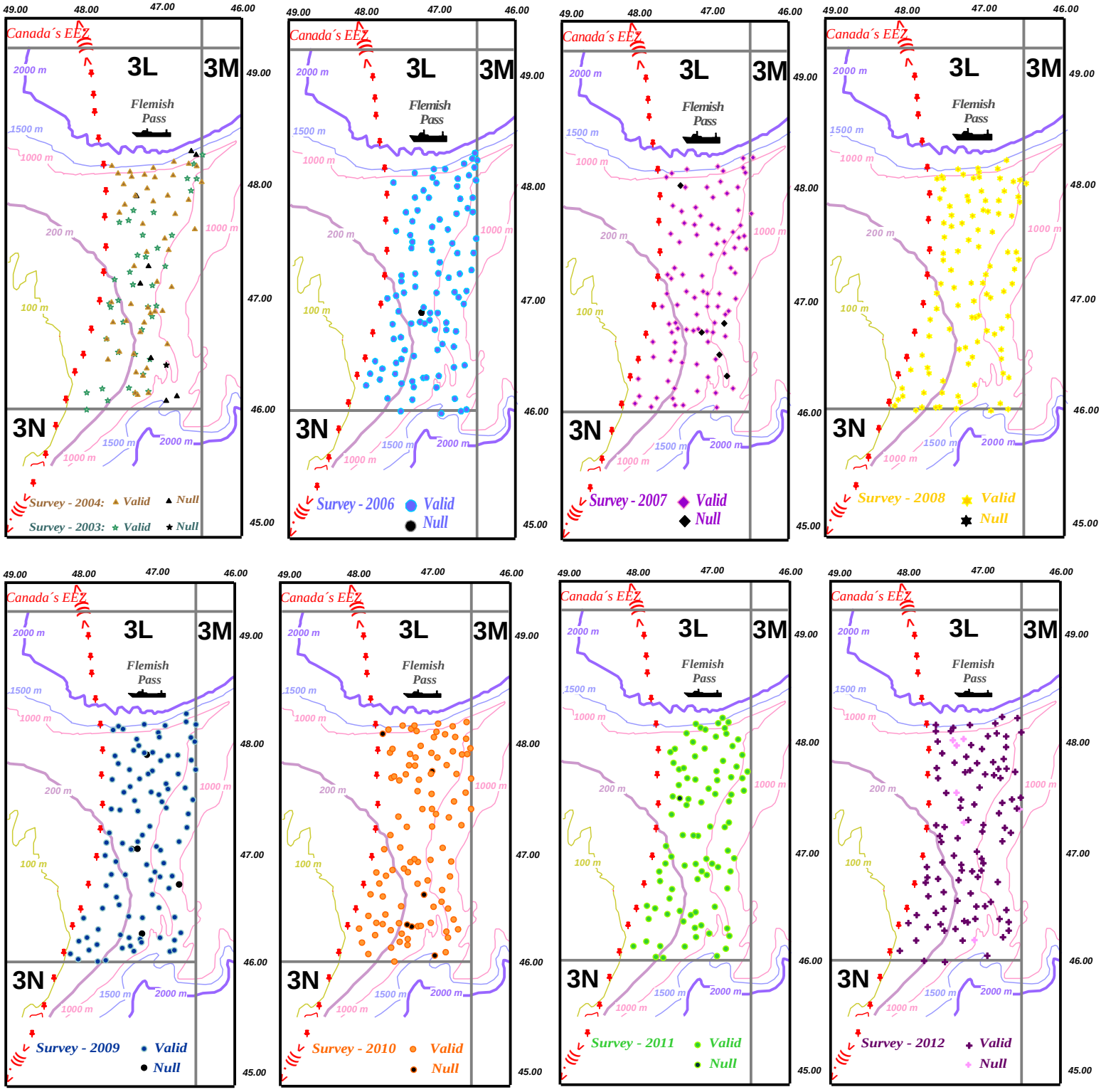

FIGURE 1.- Haul positions of the Spanish surveys in NAFO Division 3L in the period 2003 - 2012 (R/V *"Vizconde de Eza"*).

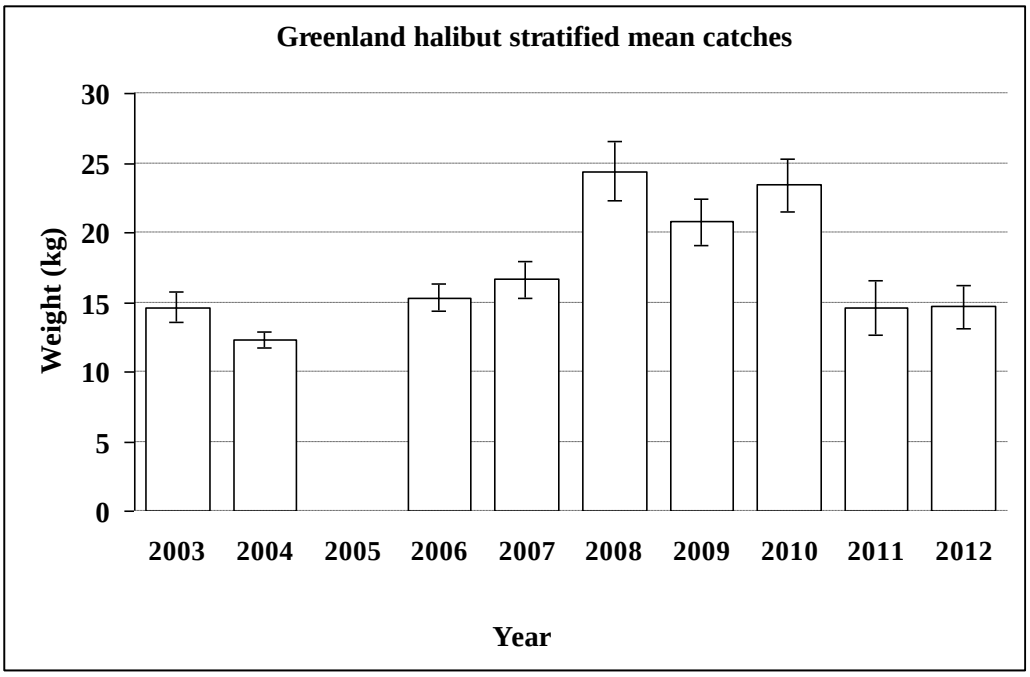

FIGURE 2.- Greenland halibut stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2012 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2012.

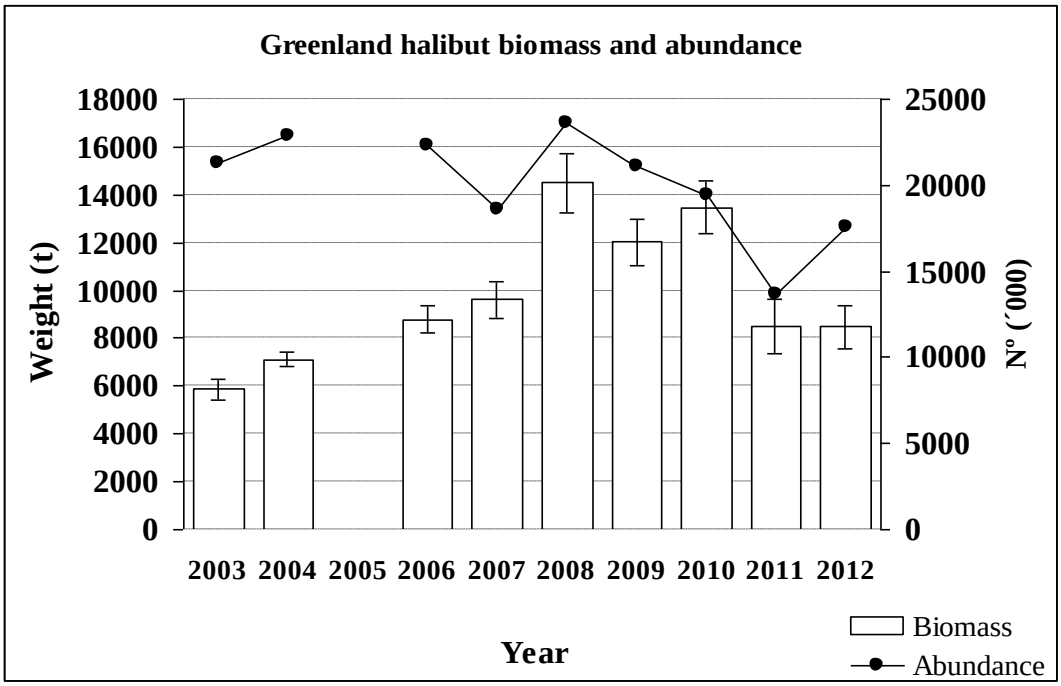

FIGURE 3.- Greenland halibut abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2012 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2012.

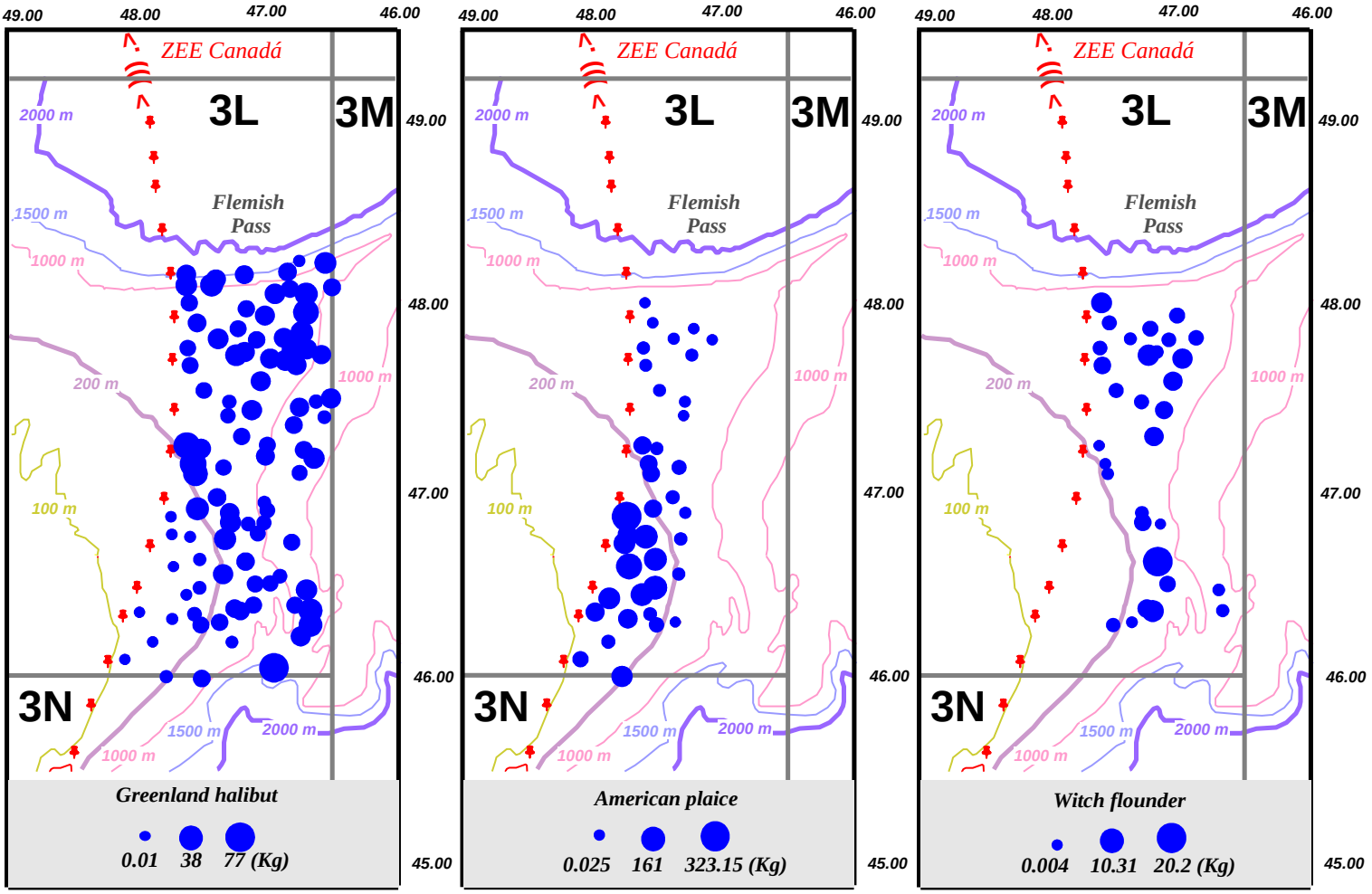

FIGURE 4.- Distribution of the catches per haul for **Greenland halibut, American plaice** and **witch flounder** in 2012 Spanish 3L survey.

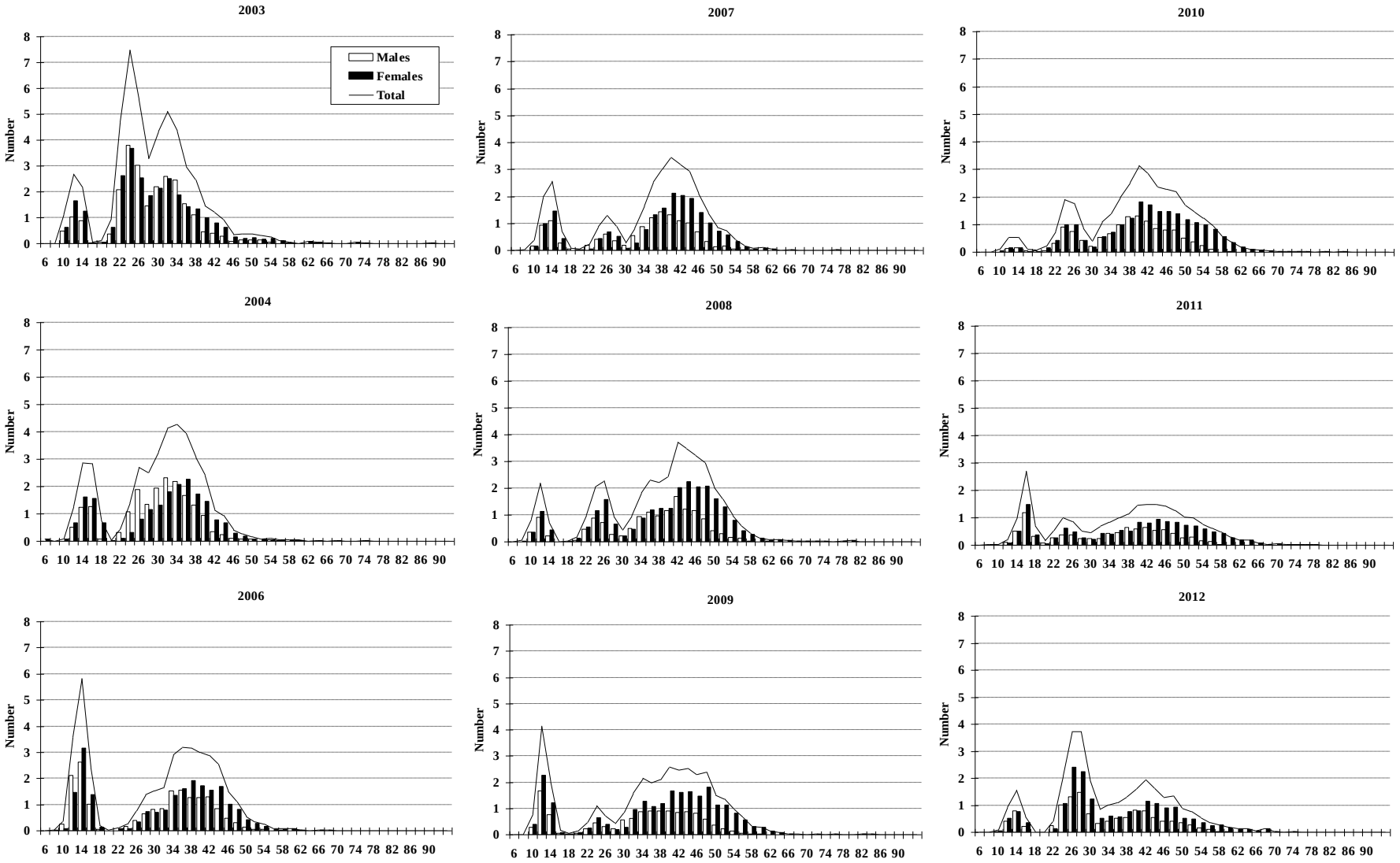

FIGURE 5.- Greenland halibut length distribution (cm) in NAFO 3L: 2003-2012. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2012.

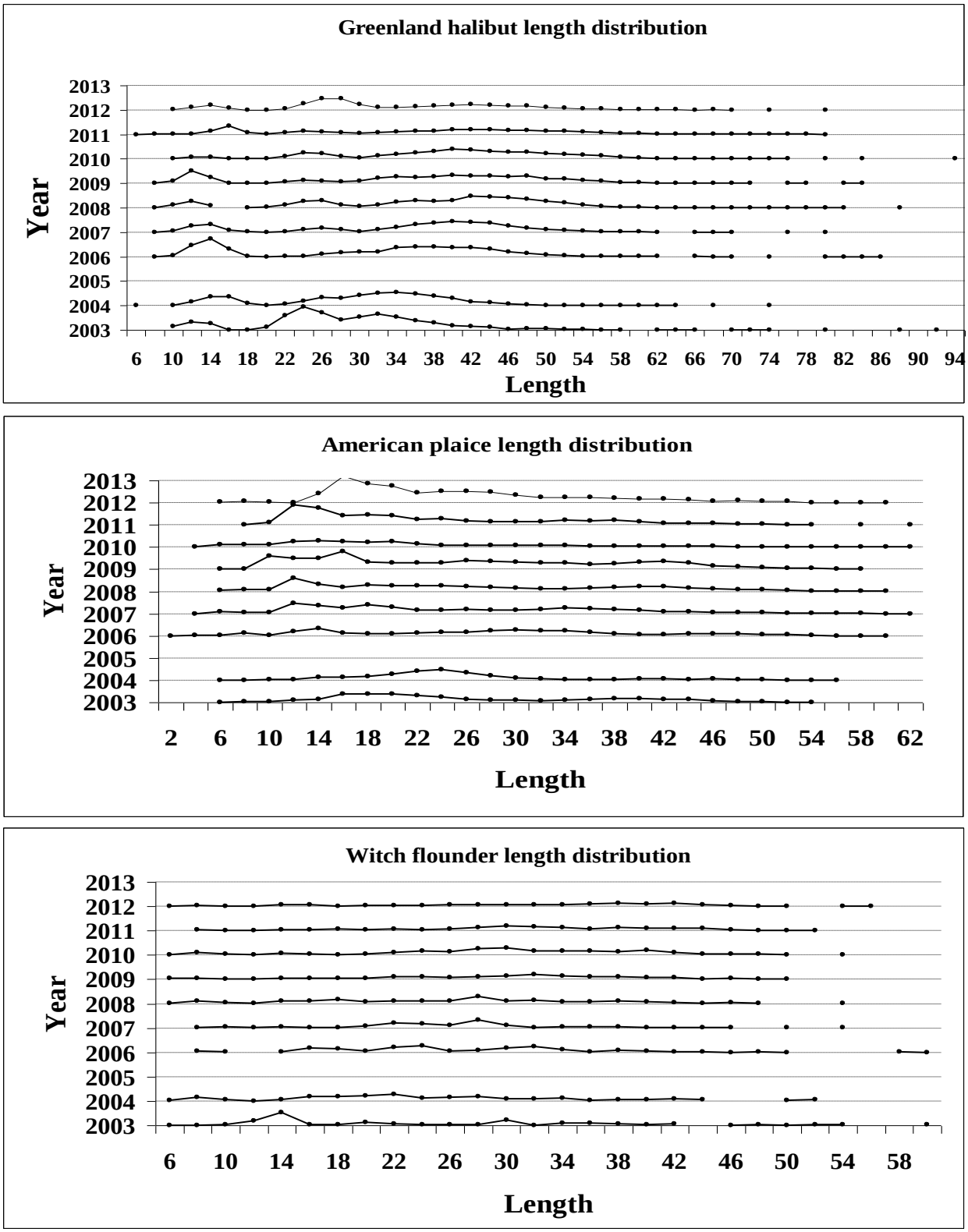

FIGURE 6.- Greenland halibut, American plaice and **witch flounder** length distribution (cm) in NAFO 3L: 2003-2012.

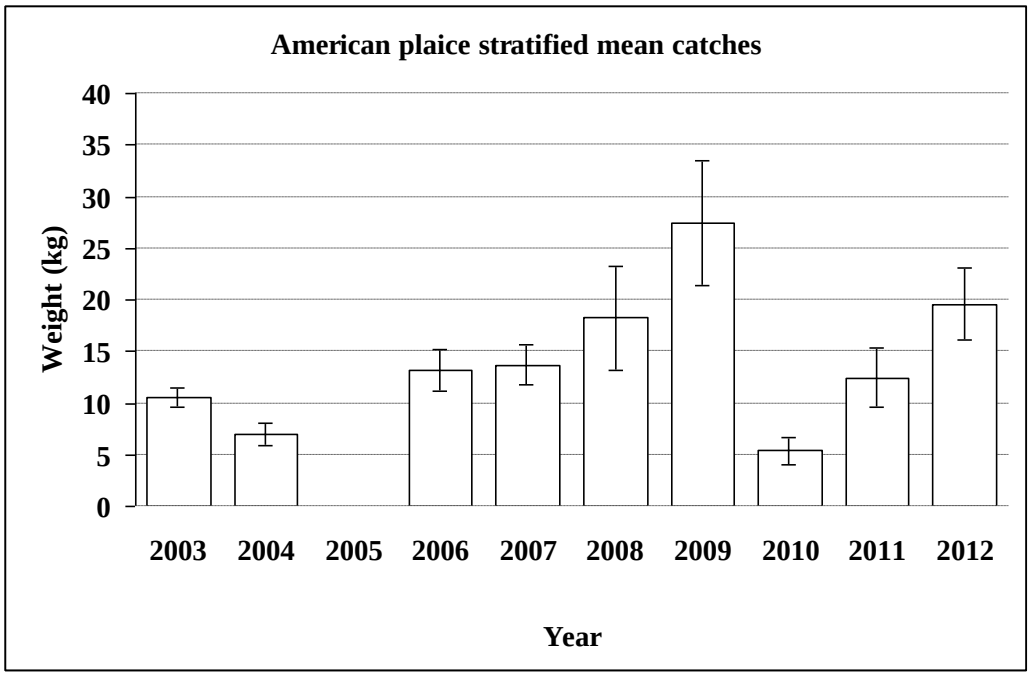

FIGURE 7.- American plaice stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2012 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2012.

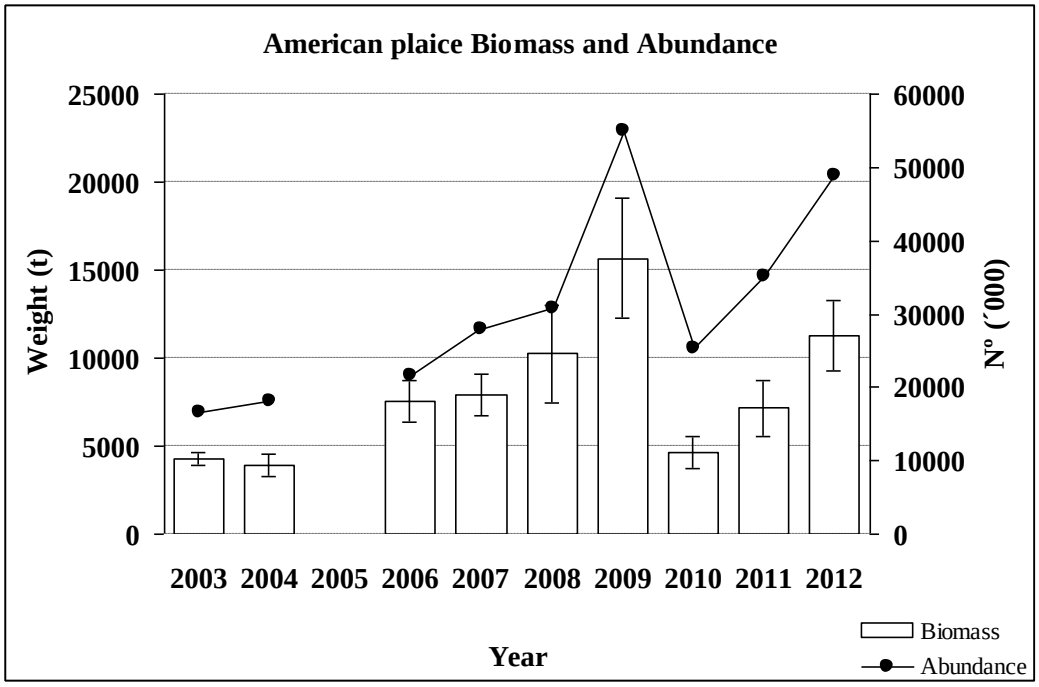

FIGURE 8.- American plaice abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2012 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2012.

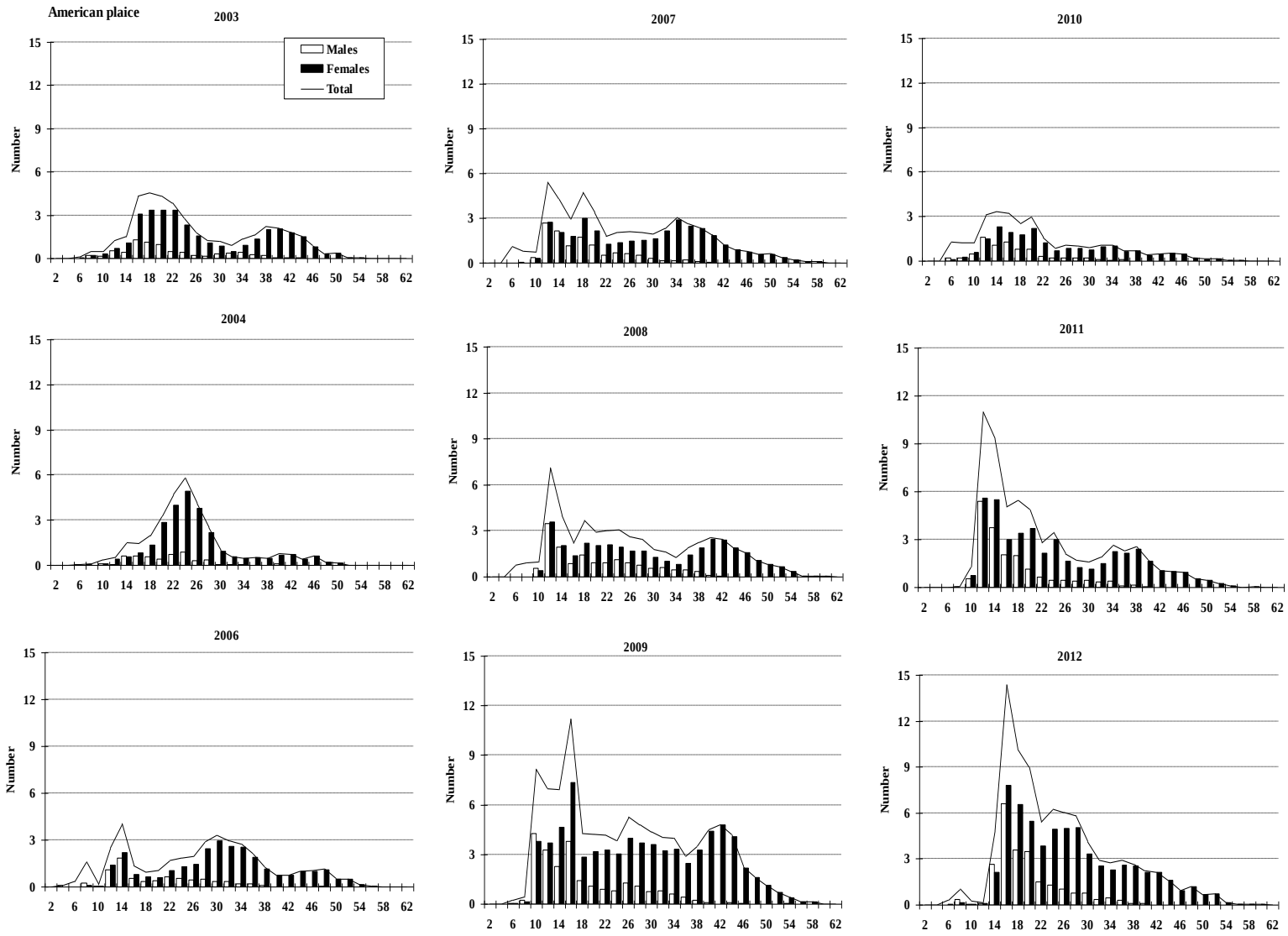

FIGURE 9.- American plaice length distribution (cm) in NAFO 3L: 2003-2012. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2012.

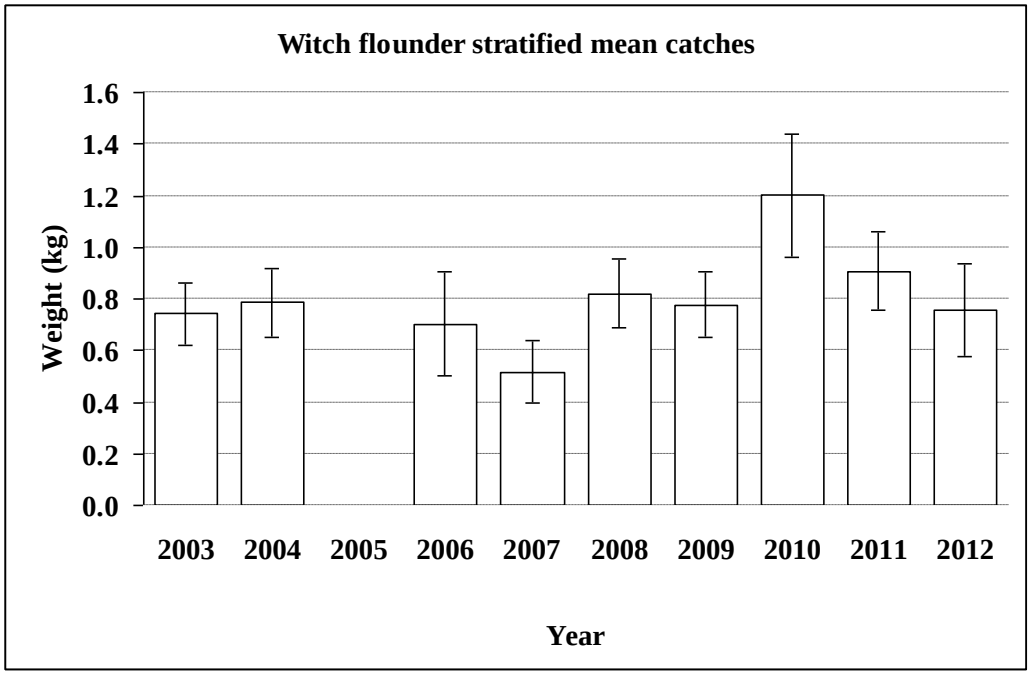

FIGURE 10.- Witch flounder stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2012 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2012.

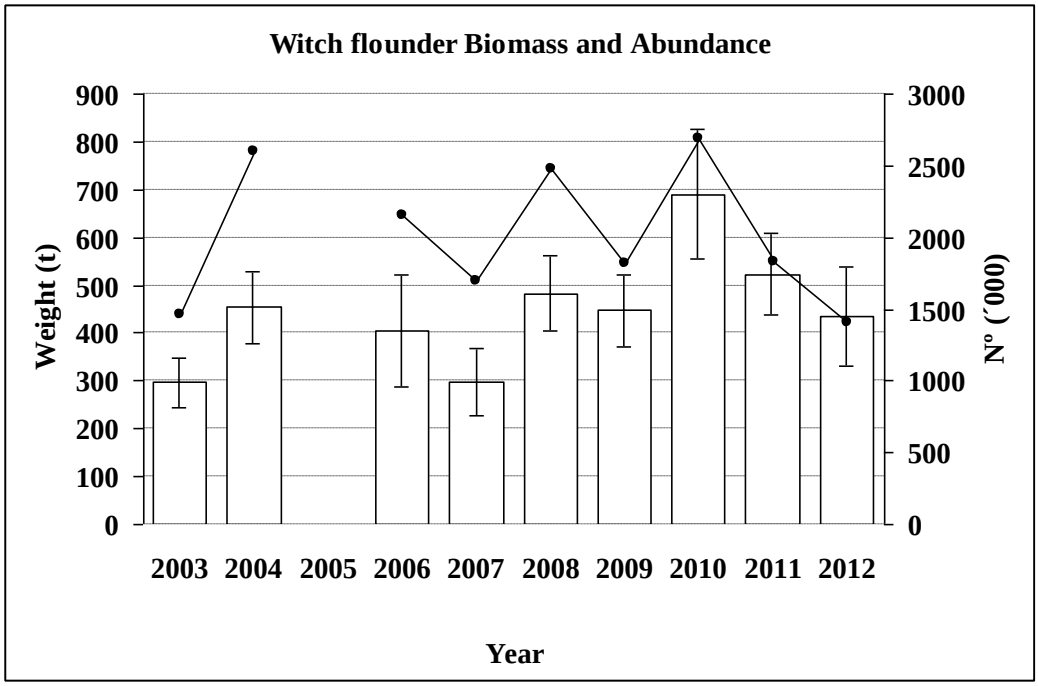

FIGURE 11.- Witch flounder abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2012 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2012.

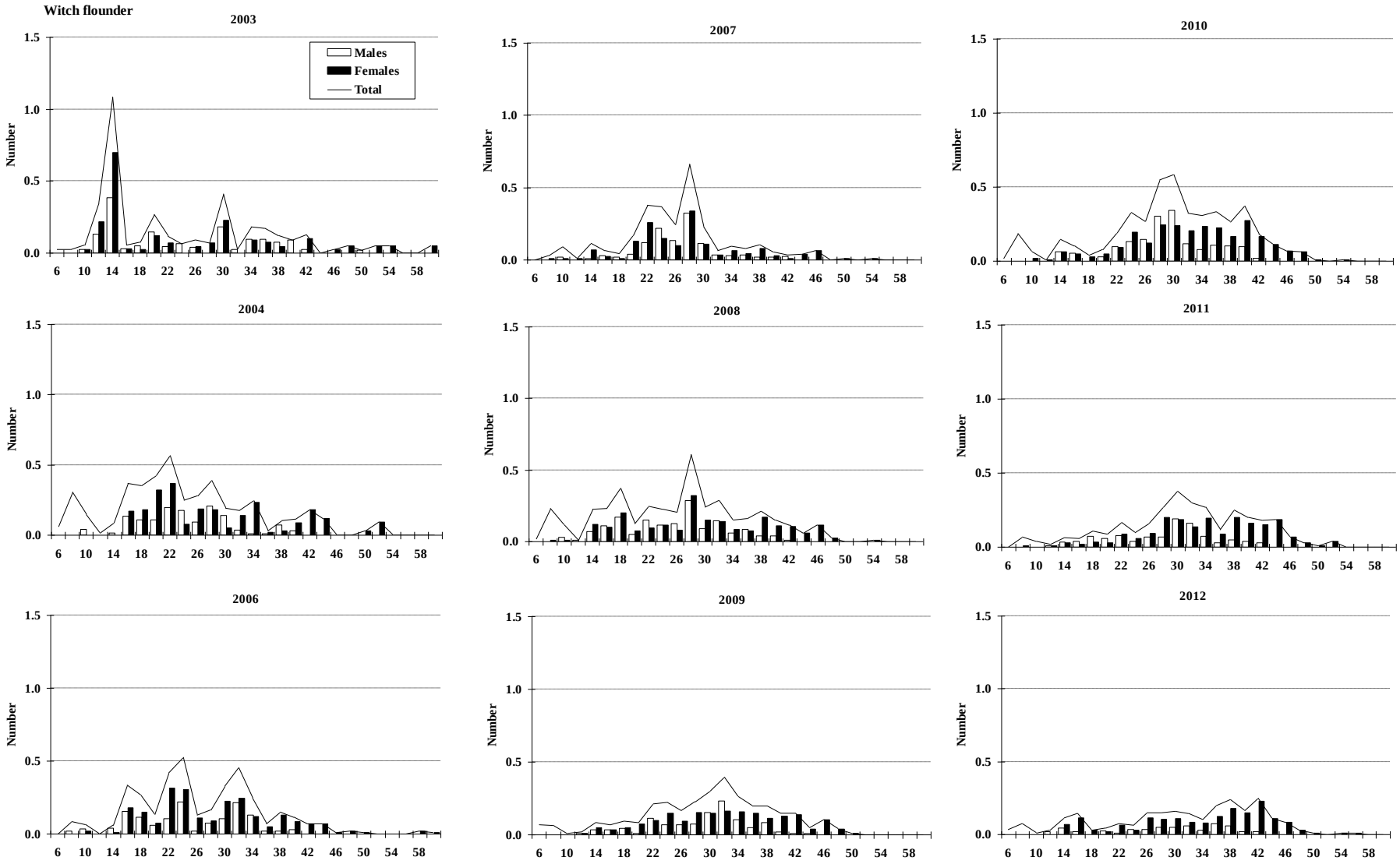

FIGURE 12.- Witch flounder length distribution (cm) in NAFO 3L: 2003-2012. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2012.